AIDS TO MEDICINE

PART III.

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PART III. (Double Part).

DISEASES OF THE
BRAIN AND ITS MEMBRANES, OF THE NERVOUS SYSTEM, OF THE SPINAL CORD, AND OF THE EAR.

BY

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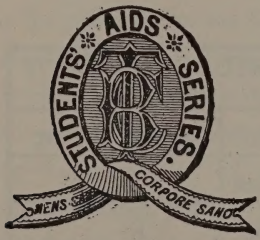

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PREFACE.

In preparing this, the second edition of "Aids to Medicine," Part III., the work has been carefully revised, almost entirely re-written, and greatly extended.

The subject is one of considerable difficulty, and, notwithstanding the great strides that have been made of late years, is still enveloped in much obscurity.

The present work merely aims at being an outline of the subject, and consists of an abstract of lectures delivered during the preparation of pupils for the Royal College of Physicians, the Apothecaries' Hall, and other Medical Examinations.

The endeavour throughout has been to lay before the reader as many *facts* as possible, referring the aspirants

to a more extended knowledge of the Brain and Nervous System to the works of Drs. Bristowe, Flint, and others.

It is hoped that the following pages may prove of some small assistance as an introduction to the study.

ARMAND SEMPLE.

8, Torrington Square, W.C.,
May, 1885.

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AIDS TO MEDICINE.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

CEREBRAL MENINGITIS (μῆνιγξ, a membrane).

Definition.—An inflammation of the membranes (the pia mater and arachnoid) of the brain.

Varieties.—(1) Simple Meningitis.
(2) Tubercular Meningitis or Acute Hydrocephalus.

SIMPLE CEREBRAL MENINGITIS.

Symptoms.—These are general fever, acute headache, obstinate constipation, vomiting, intolerance of light and sound, contracted pupils, sleeplessness, acute delirium, flushed face, and suffused eyes, succeeded by a comatose condition, with dilated pupils (indicating the occurrence of effusion), and often terminating in twitchings, convulsions, paralysis, diarrhœa, and death. These symptoms are also common to cerebritis or inflammation of the substance of the brain, from which disease this form of meningitis is not to be separated, since it is probable that the brain substance is rarely

the seat of inflammation which does not spread to the membranes, and *vice versâ*.

Causes.—These may be the infectious fevers (?), erysipelas, injuries to the head, exposure to the direct rays of a burning sun (insolatio or sunstroke), hard drinking, and syphilis.

Pathology.—An inflammation of the brain membranes. On post-mortem examination, the vessels of the pia mater are found to be enlarged and engorged with blood, and the arachnoid is opaque, serum and lymph being situated beneath it.

Treatment.—This must be antiphlogistic. All causes of excitement should be avoided, the patient must be placed in a darkened room; cold evaporating lotions, such as spirits of wine lotion and hydrochlorate of ammonia in solution, or ice-bags should be applied to the shaven scalp. A few leeches may be applied to the temples; bleeding by the arm was formerly employed.

Calomel, in doses of two grains, every three or four hours, should be given internally; saline aperients may be exhibited with advantage. Tartar emetic has been recommended by some authorities, but its utility is doubtful, and its tendency to produce vomiting is an argument against its administration.

With some physicians, opium has found favour, and in some special cases its use may be advantageous, but as a general rule this drug should be avoided in inflammatory or congestive diseases of the brain.

After effusion has occurred, as is indicated by the comatose condition and dilated pupils, mercurials should still be administered, but together with iodide of potassium, in fairly large doses (grains 5 to 10).

HYDROCEPHALUS (ὕδωρ, water; κεφαλή, a head)—
WATER ON THE BRAIN,

May be defined as an affection of the membranes of the brain, leading to watery effusion, and consequent enlargement of the head.

The disease is divided into two

Varieties.—(1) Acute Hydrocephalus, or Tubercular Meningitis.
(2) Chronic Hydrocephalus.

ACUTE HYDROCEPHALUS, OR TUBERCULAR MENINGITIS.

Symptoms.—These may vary at the commencement of the attack; loss of appetite, nausea, vomiting, and general fever sometimes precede; sometimes high fever sets in, sometimes the disease begins very slowly and obscurely, and sometimes the child is suddenly attacked. The disease usually terminates, in a few days, either in recovery or in death; but in some cases it is considerably protracted, and may be followed occasionally by the chronic form.

Although the following stages are not always clearly defined, the disease may be conveniently so divided:

Stages.—3.—(1) Excitement.
(2) Effusion.
(3) Flickering Stage, or Stage of Apparent Improvement.

(1) **Excitement Stage.**—There is acute pain in the head, great sensibility to light and sound, flushed face, hot dry skin, the *pulse hard* and *quick*, *vomiting* and *contracted pupils*, extreme restlessness, incessant moaning; the child, if asleep, often awakes screaming, and, if old enough to speak, raises the hand to the head,

uttering the hydrocephalic cry, 'Oh, my head—my head!' In infants there is at first strong pulsation in the fontanelles, which afterwards become tense and bulged outwards. The bowels are usually confined, but if opened the motions are scanty, clay-coloured, and offensive.

(2) **Effusion Stage.**—After a variable period the violent symptoms abate, the pain becomes less, the child keeps up a low moaning, lethargic torpor succeeds, the fingers are clenched upon the thumb, the *pulse* is *slow* and *intermittent;* the respirations are often interrupted by deep sighs, the *pupils* become widely *dilated,* and no longer contract by exposure to light.

(3) **Flickering Stage,** or **Stage of Apparent Improvement.**—In this stage there is an apparent improvement in the symptoms: the child becomes more lively, and perhaps takes some slight notice of what is going on around it; but the *pulse* soon becomes very *rapid* and *intermittent;* squinting (strabismus), convulsions, and paralysis succeed, and the case proceeds to a rapidly fatal termination. In fact, the apparent improvement in the child merely inspires delusive hope, and must always be regarded as precursory to death.

Causes.—Among the *predisposing* causes may be mentioned the scrofulous diathesis and hereditary phthisis; and among the exciting causes is dentition, since the disease is usually developed at the time of the first dentition, viz., from the first to the fifth year.

Pathology.—Inflammation of the membranes of the brain in strumous subjects leading to effusion. On post-mortem examination, the ventricles of the brain are distended with limpid or turbid serum, often of considerable amount; lymph is observed in various parts of the brain, especially at the base, about the optic commissure, and also between the membranes; the

cerebral substance is often softened to a creamy consistence; the convolutions are flattened; the pia mater is unusually vascular, the arachnoid opaque; minute opaque, or semi-transparent bodies, single or in patches, or large portions of tuberculous matter, varying from the size of a millet seed to that of a pea, are often found upon the surface of any of the membranes of the brain and in its substance. There are usually tubercles in other parts of the body, especially in the mesenteric glands.

Treatment.—If the child be robust, it may be placed in a warm bath, a few leeches may be applied to the temples, or the ice-bag and cold evaporating lotions to the scalp. In every case light and sound should be excluded, and one grain of calomel mixed with a little sugar should be placed on the tongue every three or four hours; a saline aperient, as tartrate of potash, may also be given combined with syrup of senna. When effusion comes on, iodide of potassium may be employed with advantage, followed by the administration of the syrup of the iodide of iron and cod-liver oil.

HYDRENCEPHALOID DISEASE, OR SPURIOUS HYDROCEPHALUS.

Symptoms.—This is an affection which is frequently mistaken by mothers for the true form; and they will constantly ask, should the child have a somewhat large head, if it is suffering from water on the brain? The symptoms and points of distinction from the true form, however, are the following: there are excitement, irritability, and sleeplessness; the cheek is pale, the skin cool or cold, but there is *no vomiting, no alteration of pupils,* and febrile symptoms are absent, with the exception, perhaps, of a transient and occasional flushing of the face. In infants, the fontanelles are *depressed,*

not swollen. Notwithstanding the apparent urgency of many cases of spurious hydrocephalus, it may be confidently asserted that almost every case ought to, and does, recover under appropriate treatment.

Causes.—This condition is due to eccentric causes of irritation, such as dentition; intestinal irritation; worms; improper, deficient, or unsuitable food; or to a general weak state of the health, or cachexia.

Treatment.—This must depend upon the cause. If worms are present, they may be expelled by injections of quassia, or common salt, and the internal administration of vermifuges, as pulvis jalapæ compositus, pulvis scammonii compositus, santoninum, etc. At the same time, the general health should be supported by cod-liver oil, iron preparations, and good nourishing food judiciously employed; if dentition be the cause, the gums should be lanced. In all cases the bowels should be cleared by hydrargyrum cum creta, and some mild antacids, as soda and magnesia, should be given.

CHRONIC HYDROCEPHALUS

Sometimes may follow the acute form, but children are occasionally born with the malady, in which case it constitutes one of the causes of tedious labour. It is rarely observed in adult age, usually taking place between birth and eight years of age, and it is generally caused by some hereditary predisposition.

Symptoms.—These are very insidious, but may include drowsiness, languor, strabismus, vomiting, constipation, and convulsions.

When the chronic form succeeds the acute, the head enlarges by degrees, the fever, headache, and other symptoms subside; but it more often happens that the

affection insensibly originates without any preceding acute stage.

The head sometimes becomes of an enormous size. Fluid is contained in great quantity in the lateral ventricles, by which cause the convolutions are unfolded, the cranial bones and sutures separate, the fontanelles are full and transparent, distinct fluctuation being perceptible on pressure, the face retaining its normal size, and the expression of the physiognomy becoming extremely peculiar. In rare instances, in place of general enlargement of the head, a fluctuating tumour may be found near the occiput. Under these circumstances, since this tumour is surrounded by the brain-investments, upon pressure the fluid produces compression of the cerebral substance, inducing convulsions and coma. In spite of the enormous enlargement, life may continue for many years.

It is stated that in some instances the intellectual faculties are highly developed, but in the majority of cases the senses become blunted, and the intellect impaired or altogether lost with the advance of the disease. Muscular power is much weakened, the child being unable or unwilling to move; and at last the greatly distended head is no longer able to be supported, but droops upon the chest or shoulder. The gradual decrease in the locomotive and sensitive capabilities during the increase of the size of the head indicates the progress of chronic hydrocephalus after the child has passed the first year of its life.

Treatment.—This must consist:

(1) In promoting the absorption of the effused fluid, and

(2) In improving the general health.

For the first indication, the following measures are to be recommended:

(*a*) Calomel in $\frac{1}{4}$ or $\frac{1}{2}$ grain doses, or some other mild mercurial, twice daily, with inunction of one or two drachms of mild mercurial ointment into the shaven scalp, once in twenty-four hours.

(*b*) Diuretics of squills and digitalis, or acetate of potash and iodide of potassium.

The second indication may be accomplished by careful regulation of the diet, which should be light and nutritious; by cod-liver oil and iron preparations, quinine, etc.; and by change of air and seaside residence.

The head is sometimes compressed by strapping-plaister, and, in extreme cases, tapping has been employed with success.

CEREBRITIS. ENCEPHALITIS (ἐν, in; κεφαλή, head; itis). **PHRENITIS** (φρήν, the mind; itis).

Definition.—Inflammation of the substance of the brain.

Causes.—It is rarely, if ever, idiopathic; but it may be caused by exposure to the sun, by injuries to the head (as in concussion), by disease of the cranial bones, by a large quantity of alcoholic drink taken at once, or by certain poisons, as belladonna.

Symptoms.—These are often rather vague and obscure, and since encephalitis and meningitis are usually combined, may be the following, viz.: Severe pain in the head, vomiting and constipation, contracted pupils, heat of scalp, intolerance of light and sound, a full, hard, and strong pulse, with great excitement, terminating in recovery, or in convulsions, paralysis, coma and death.

In all probability, most of the so-called cases of 'brain fever,' were, and are really, cases of typhoid fever, in which disease the brain symptoms are often very prominent.

Treatment.—This must depend very much upon the cause, and the individual cases; bleeding by the arm and the local application of leeches have sometimes proved of service; the ice-bag to the shaven scalp and antiphlogistic remedies are always to be recommended. Calomel, in repeated doses, with saline aperients and low diet, must always be exhibited, and light and sound entirely excluded.

Varieties.—(1) General.
(2) Partial or Local.

General encephalitis is especially associated with meningitis.

Local encephalitis may lead to red softening, or to

ABSCESS OF THE BRAIN.

Causes.—Diseases of the ear, nose or orbit, or other parts of the skull. It is sometimes secondary to encephalitis.

Symptoms.—These are sometimes fairly definite; amongst the most important being acute headache and discharge from the ears (otorrhœa), especially after the symptoms described under encephalitis have been observed. But it must be remembered that cases have occurred in which no symptom has been apparent except acute headache, which has probably been considered as neuralgic, and its true nature discovered only after death.

Pathology.—Abscess of the brain may occur in the middle or posterior lobe; the petrous portion of the temporal bone is almost always carious. The dura mater covering it is inflamed, and an abscess is found in a diseased patch of brain, the pus being green and offensive. It is not uncommon to find, in recent cases, a cavity filled with reddish or yellowish fluid, bounded

by reddened, softened brain substance; in older cases, encysted pus will be observed, *i.e.*, enclosed in walls formed by connective-tissue.

Treatment.—This must be antiphlogistic; attempts must be made to alleviate the distressing headache, and to check the aural discharge; but if the disease be thoroughly established, very little benefit can be expected.

SOFTENING OF THE BRAIN.—RAMOLLISSEMENT.

Causes.—Inflammation or anæmia, mental emotion, or long-continued intellectual exertion. It is most liable to take place between the ages of 50 and 80.

Varieties.—(1) The Red or Inflammatory Softening.
(2) The White, Yellow, or Non-Inflammatory Softening.

In the **Red** or **Inflammatory** variety, the brain is soft and pulpy, of a red colour, and often presents numerous blood-points (puncta vasculosa).

Microscopically, the nerve-tubes are seen broken up and mixed with blood-cells, pus-cells, granular matters, and dark granular fatty bodies like mulberries, called "exudation corpuscles." The minute arteries are also covered by fatty and granular materials.

In the **White, Yellow,** or **Non-inflammatory** softening, the brain is soft and pulpy, becoming ultimately of a creamy consistence, white or yellow in colour, and capillary hæmorrhages are sometimes found upon the exterior of the affected part.

Microscopically, softened and disintegrated nerve-fibres, granular matters (resulting from the destruction of the nerve-tissue), the colour being due to the admixture of the fat granules with the colouring matter

of the blood, fatty blood-vessels, and fatty cells are observed.

White softening is always the result of imperfect nutrition of the affected part; it is a frequent consequence of the blocking of an artery by a plug (embolism), and it may be caused by the pressure of a tumour or hæmorrhagic clot upon the circulation of the surrounding parts.

Brain softening may sometimes be suspected from the occurrence of paralysis alternating with spasm, or by the more or less permanent contraction of the flexor muscles of one or both extremities, and usually there are affection of the speech, loss of memory and of intelligence, delusions, headache, drowsiness, and paralysis slowly advancing; but the symptoms of softening of the brain are often very obscure, and the condition is sometimes only detected after death; it cannot be said that there are any pathognomonic symptoms of this malady.

Induration or Hardening of the Brain.—This condition is usually considered to be, and often is, the result of chronic inflammation. The cerebral mass resembles wax or boiled white of egg. Some cases which during life have been regarded as softening of the brain have upon post-mortem examination proved to be really instances of induration.

INTRACRANIAL TUMOURS.

Of these the following are the most important:

(1) **Tubercle**, either in a single mass or in collections, chiefly in children.

(2) **Carcinoma.**—Three varieties: Scirrhus (hard), Medullary (soft), and Colloid (gelatiniform).

(3) **Fibroid**, or **Fibro-plastic**, single or multiple, sometimes of considerable size, and sometimes called *sarcomata.*

(4) **Cholesteatoma**, or **Pearly Tumour**, consisting of cholesterine.

(5) **Hydatids** (rare).

(6) **Osseous** or **Bony.**

(7) **Lipomata**, or **Fatty.**

(8) **Aneurismal**, generally at the base of the brain, usually small, sometimes of the size of a pigeon's egg.

Since the brain in health almost fills the cavity of the cranium, the growth of a tumour must encroach upon the brain substance. In consequence, pain, generally severe and localised, is usually a marked symptom, accompanied by impairment of sight, taste, and hearing; not unfrequently, however, convulsions, giddiness, and local paralysis are present. When the pain in the head is fixed and intense, and there is a syphilitic history, it is probable that the cause of the tumour is syphilis, and the discovery of nodes on any part of the body renders the diagnosis more certain.

PARALYSIS (παραλύω, to relax).

Definition.—A total or partial loss of motion and sensibility, or of one or of both, in one or more parts of the body.

Divisions.—PERFECT; in which both motion and sensibility are affected.

IMPERFECT; when one or the other only is diminished or lost.

IMPERFECT PARALYSIS is divided into:

ACINESIA, or paralysis of motion; and

ANÆSTHESIA, or paralysis of sensibility.

Again, paralysis may be GENERAL, affecting the whole body; or PARTIAL, affecting only a portion of it.

PARTIAL PARALYSIS is divided into:

HEMIPLEGIA, when limited to a lateral half; and

PARAPLEGIA, when confined to the inferior half of the body.

LOCAL PARALYSIS is much more limited, such as when a small portion of the body is affected, viz.: the face, a foot, a limb.

Paralysis of the eye, or insensibility of the retina to the rays of light, is termed AMAUROSIS.

Paralysis of the levator palpebræ superioris, in which the upper eyelid falls over the eye = PTOSIS PALPEBRÆ.

Insensibility to sound (deafness) = COPHOSIS.

Insensibility to odours (loss of smell) = ANOSMIA.

Loss of taste = AGEUSTIA.

Certain forms of paralysis may arise from mineral poisons—as mercurial palsy, and lead or saturnine palsy.

Pathology.—Paralysis in its pathology generally depends upon an obstruction in the course of either the nerves, or nervous filaments, which enter into the composition of the brain or spinal cord, the transmission of volitions, or passage of sensitive impressions, being—separately or conjointly—thereby restricted or prevented.

Paralysis is, however, sometimes only functional.

GENERAL PARALYSIS.

This term may be applied to paralysis affecting the four extremities, whether any of the other parts of the body be implicated or not. If complete loss of motion and sensation of the whole body takes place, death must immediately ensue; but during the career of certain kinds of mental derangement, a gradually progressive palsy eventually invades almost all the muscles of the body, and from this fact it has been termed 'General Paralysis.' As the affection proceeds, the physical powers decrease, there is inability to walk, sit, or stand, and the patient becomes bed-ridden. Death may result from inability to swallow, or from exhaustion, or some intercurrent malady. Upon ophthalmoscopic examination the optic nerve has been found atrophied.

The term 'General Paralysis' is, however, usually applied, in a restricted sense, to a well-marked disease of the insane, viz.:

GENERAL PARALYSIS OF THE INSANE.

Symptoms.—These are slow in development, and usually first declare themselves by extreme *exaltation of ideas*, such as the supposed acquisition of great wealth and power, etc. The speech is hesitating and stammering, and the gait halting and uncertain. All these symptoms increase gradually but surely, the speech and the intellect becoming eventually lost altogether. The uncertain movements result in a condition in which movement is entirely lost, and the mind becomes a blank, death being the slow but certain termination.

HEMIPLEGIA (ἡμισυς, half; πλησσω, I strike).

Definition.—Paralysis of one side, generally comprising both the upper and lower extremities.

This affection is generally spoken of as 'a paralytic stroke.'

Hemiplegia is the most common form of paralysis. When limited to one extremity, the arm is generally the part affected.

The paralysis usually extends to the side of the face, the angle of the mouth being drawn somewhat upwards to the sound side, in consequence of the muscles on that side being no longer counter-balanced by the corresponding muscles of the paralysed side. The tongue may also be affected, its point, when protruded, usually, though not always, turning to the side of the paralysis, since the protruding muscles are powerless on that side. The paralysis is invariably limited to one half of the body (usually the left, although in most cases the lesion is on the right side of the brain), the median line being the boundary.

Anæsthesia is usually present. The mental faculties may be uninjured, but are generally more or less impaired. Memory is specially affected. There is a peculiar tendency to shed tears, and to be affected by trifling causes. If recovery takes place, the first signs of improvement are observed in the leg, which is drawn after the sound one in a shuffling manner; and if the sufferer is able to raise the foot so far the toes are pointed to the ground. In a fatal case, the limbs waste, and they are colder, and more susceptible to heat and cold than the sound parts.

Transverse, or crossed palsy, is a term applied to a very rare form, in which the upper limb of one side and the lower of the opposite side are affected.

Causes.—These are the following: Organic lesions of the brain : Apoplexy (the effused blood being usually found upon the side of the brain opposite to the affected side of the body, probably due to the decussation of the fibres of the anterior pyramids at the junction of the medulla oblongata and medulla spinalis): Lesion of one half of the spinal cord just below the decussation of the pyramids.

Hemiplegia may imply cerebral or spinal paralysis. A transient hemiplegia may be produced by epilepsy, or it may even follow chorea. In nervous women there is a form called hysterical hemiplegia; a peripheral form is also known, in which the disease creeps from periphery to centre.

To distinguish between cerebral and spinal paralysis, is a matter of considerable difficulty.

Mercurial Palsy, or Mercurial Tremor,

Consists in a sort of convulsive action of the voluntary muscles, commencing in the arms and sometimes spreading to the tongue, jaws, and eyes, the action being increased by the will being brought to bear upon those parts.

In advanced stages, articulation, mastication, and locomotion are performed with difficulty. The use of the hands is almost completely lost. The teeth turn black, the skin acquiring a brown hue. Barometer-makers, gilders of buttons, glass-platers, and all workmen continually exposed to the fumes of mercury, are very liable to this form of palsy. The movements are intensified upon any attempt at exertion, or when the mind is brought to bear upon them.

Cupric Palsy, or **Copper Tremor**, may exhibit symptoms similar to the mercurial form.

Lead Palsy usually follows or accompanies Colica Pictonum, but it may exist independently. The extensor muscles of the hands and fingers become paralysed, the hands falling by their own weight when the arms are stretched out, constituting the so-called *wrist-drop*. Lead colic is usually present.

The blue line (sulphide of lead) round the edges of the gums, at their junction with the teeth, is a characteristic sign. This affection is usually observed in type-founders, painters, colour-grinders, plumbers, etc.

INFANTILE PARALYSIS; OR, PARALYSIS OF CHILDHOOD.

Paralysis in children may be divided into four chief **Varieties.**—(1) Obstetrical Paralysis.
(2) Paralysis consequent upon cerebral disease.
(3) Infantile Paralysis proper.
(4) Paralysis of Duchenne, or Pseudo-hypertrophic muscular paralysis.

OBSTETRICAL PARALYSIS

Occasionally results from the pressure exerted by one blade of the forceps on the portio dura of the 7th nerve at its exit from the stylo-mastoid foramen. Paralysis of the upper extremity may take place during the operation of turning, since by undue violence the brachial plexus may be lacerated or injured.

PARALYSIS CONSEQUENT UPON CEREBRAL DISEASE

May result from meningitis, apoplexy, hydrocephalus, and brain tumours; and it may follow rheumatism, diphtheria, typhoid fever, and scarlatina. Hemiplegia, following meningitis, has been observed in a child 19 months old. Paralysis is sometimes associated with dentition, laryngismus stridulus, and convulsions, and facial paralysis may result from disease of the petrous portion of the temporal bone.

INFANTILE PARALYSIS PROPER,

sometimes called Infantile Spinal Paralysis, occurs in young children, and its exact nature, even now, is not thoroughly understood. It shows a special tendency to affect children under two years of age. Sensation is totally unaffected, the paralysis being intrinsically motor. The invasion is usually sudden, is accompanied by pyrexia, and terminates in atrophy of the muscles, and complete paralysis. The limbs are not always affected exclusively. The lumbar muscles may be implicated, and the spine curved to a greater or less extent. No morbid appearances are found in the brain or the cranial nerves.

Causes.—This affection is liable to occur in children who have suffered from previous ill-health, or from febrile or nervous affections; or it may follow cold and convulsions, diphtheria, ulcerated sore throat, or some eruptive fever. Blows and falls on the hip may produce the disease. Delayed dentition in a ricketty child must also be regarded as causative.

Symptoms.—The paralysis may come on in a few

hours; inability to stand is sometimes the only symptom. There is usually no pain.

There is sometimes febrile disturbance, lasting some days, accompanied by thirst, anorexia, screaming, headache, and convulsions. The legs are the limbs more often affected, although in some cases the arms alone may be affected—sometimes one arm or one leg, or one leg with one arm of the opposite side, or the same sides, are the seats of the paralysis. The right leg is the most common seat, and in rare cases both legs and both arms are affected.

If paralysis take place in one arm, let us suppose the right, the child will use the left hand for drinking and eating purposes, never using the right hand at all. The fingers and thumb may be spread wide apart, and the back of the hand presents on extension a concave aspect. The hand drops useless at the wrist, the thumb is bent inwards to the palm, and there is looseness of the articulations of the phalanges. When the leg of the same side is the seat of paralysis constituting hemiplegia, the child moves unsteadily, less freedom being exhibited than on the sound side. The child turns on the foot, the ankle-joint simultaneously being bent inwards, so that he rests chiefly on the inner border of the foot.

The muscles of the thigh, those of the gluteal region, gastrocnemius, and muscles of the feet are often much wasted; the affected limb generally feels colder than the sound one, since the blood-vessels are diminished in size. The toes frequently look blue, and a liability to chilblains is not uncommon. The atrophy is sometimes so considerable that the bone is merely covered by skin. Deformity of one or both feet is not rare. There is often an absence of patella tendon reflex in the paralysed limb. The flexor muscles frequently become contracted permanently in infantile paralysis, since the

extensor muscles are more often affected than the flexors. No contraction of the muscles takes place under faradisation, since reflex excitability is soon lost. An excess of phosphates is often observed in the urine. The chief points of distinction between the so-called infantile form and other forms of paralysis are, the absence of pain, of irritation of the skin, and of bed-sores.

Pathology.—The latest observations of this affection seem to indicate an inflammation of the anterior cornua of the grey matter of the spinal cord, from which arise the spinal nerves. Atrophy of the large cells takes place, being followed by their subsequent disappearance. Charcot is of opinion that the disease commences with inflammation of the ganglionic cells of the anterior cornua of the grey matter of the spinal cord, which by degrees extends to other situations. The cervical, dorsal, and lumbar portions of the cord may be affected, but the dorsal is the least often implicated. It occasionally happens that the muscles increase in bulk instead of shrinking. In cases which have proved fatal after having lasted for some years, the posterior cornua are found healthy, the anterior cornua being changed and their cells disintegrated. There is flaccidity and atrophy of the muscles, which are to some extent replaced by fat, and the interstitial tissue is hypertrophied; the bones are shorter, the tendons smaller, and there is enlargement of the medullary canal.

PARALYSIS OF DUCHENNE, OR PSEUDO-HYPERTROPHIC MUSCULAR PARALYSIS,

Is a rare form, associated with enlargement of certain muscles. The children of the rich are more liable to this paralysis than those of the poor, and it may occur in those who previously have been vigorous, and who have passed well through the teething period.

It is said to be most common in dull and idiotic children.

There is no fever, and the disease is very slow in its progress.

Symptoms.—There is weakness in the lower limbs, eventually succeeded by loss of reflex excitability. If old enough to walk, the child plants the foot cautiously and timidly on the ground, and moves with a shuffling gait; at each step he swings the arms and sways the body from side to side; upon meeting with any obstacle he is apt to tumble, and is unable to get up unless assisted. When standing, the feet are spread apart, and the toes turned outwards. The following action is considered *pathognomonic* of the malady. When an attempt is made to rise from the ground, the child bends one knee, supporting himself by placing his hands upon it or upon some near object; then he bends the other knee into the position for kneeling, and in this manner, grasping the thighs from below upwards, raises by degrees the body and shoulders into the upright position, proceeding very gradually and cautiously, as if afraid of falling.

Attention is first called to the disease by the child being unable to walk when old enough so to do, or by its being very weak on the legs when the period has arrived at which it can stand by itself, walk, or run.

After the muscular weakness has continued for many months, the muscles of the leg become *larger*, and in course of time those of the buttocks and loins also may become enlarged, resembling the hypertrophy occasioned by healthy exercise.

The condition of hypertrophy may last for many years, gradual and complete paralysis ensuing, and motor power being lost in the unaffected muscles, whilst the size of the hitherto enlarged muscles now diminishes. The child may eventually succumb to some visceral affection.

The *Prognosis* is always very serious. The disease usually extends upwards, implicating the muscles of deglutition and respiration, death taking place either from asphyxia or exhaustion. Some intercurrent affection is usually the immediate cause of death.

Pathology.—The muscles of the calf of the leg become overgrown. Upon section in one case the gastrocnemius resembled a fatty tumour, presenting a mass of greasy fat, with entire absence of muscular redness. Microscopically there appear degenerations both in number and size of the muscular fibres, with considerable hypertrophy of their connective-tissue. The affected part of the muscle is freely covered with fat.

PARALYSIS OF THE CRANIAL NERVES.

The following results take place in paralysis of the several pairs :

1st Pair. **Olfactores.** Destruction or impairment of the sense of smell.

2nd Pair. **Optici.** Blindness.

3rd Pair. **Motores Oculi.** Divergent strabismus (external squint), from paralysis of the internal rectus, the action of the external rectus being unbalanced.

Rotation of the eye outward by the superior oblique, the inferior oblique being paralysed.

Dilatation of the pupil from paralysis of the circular fibres of the iris, the radiating fibres, which are supplied by the sympathetic, acting only.

Ptosis, or dropping of the upper eyelid, the levator palpebræ being paralysed, and the action of the orbicularis palpebrarum being unbalanced.

Protrusion of the eyeball from some unknown cause.

4th Pair. **Trochleares, or Pathetici.** Loss of power of rotating the eye in the orbit from paralysis of the obliquus superior, the obliquus inferior acting only. Double vision occurs if one of these muscles is paralysed, the image impressed upon the affected eye being oblique in regard to the other.

5th Pair. **Trifaciales, or Trigemini.** Paralysis of the masticatory muscles on the same side if the lesser or the non-ganglionic portion of the nerve be affected. When the ganglionic, or greater portion is the seat of mischief, there is loss of sensibility on one side of the face, of the mucous membrane within the mouth, and of the conjunctival membrane of the same side, with loss of taste in the anterior two-thirds of the tongue. When the nerve is divided anteriorly to the casserian ganglion remote effects are: inflammation, ulceration, and, perhaps, sloughing of the cornea, with discharge of the humours of the eye.

The sense of smell is injured, usually through swelling and excessive secretion of the Schneiderian membrane, and the obstruction to the nares by accumulated mucus, but occasionally from diminution of the secretion and dryness of the parts.

Hearing is also impaired, in all probability, for similar reasons.

6th Pair. **Abducentes.** Convergent strabismus (internal squint); the external rectus being paralysed, and the internal rectus thus unbalanced. Paralysis of this pair is often associated with paralysis of the 3rd pair, and thus immobility of the eyeball in regard to lateral movements is produced.

7th Pair. **Portio Mollis, or Auditory Portion.** Since this nerve supplies the internal ear, when it is paralysed, deafness is caused.

Portio Dura, or Facial Portion (Bell's Paralysis). The eyelids remain open; there is inability to close the eye or to wink, from paralysis of the orbicularis palpebrarum, the action of the levator palpebræ superioris being unbalanced. Conjunctivitis, and sometimes opacity of the cornea and corneitis are set up, from the constant exposure of the conjunctiva, both in sleeping and waking hours.

Since this nerve supplies all the muscles of expression of the face, the features become blank and unmeaning when it is paralysed. In smiling or speaking, the mouth, and sometimes the nose, is drawn to the opposite side. The tears run down the cheeks from paralysis of the tensor tarsi and displacement of the puncta lacrymalia. The nostril is collapsed and flattened, the angle of the mouth is depressed, and the lips cannot be approximated; there is, therefore, inability to whisper or to whistle, and the labial consonants v, b, p, are but imperfectly pronounced. The saliva dribbles from the angle of the mouth; eating and drinking are performed with difficulty, the food accumulating between the gums and cheeks: the velum pendulum palati is sometimes abnormally flaccid, and the uvula is said to be deflected to the opposite side.

The sense of smell is impaired from paralysis of the compressors and dilators of the nostrils, and consequent

inability to direct a brisk current of air to the upper or olfactory part of the nasal fossæ.

Hearing is impaired by paralysis of the muscles of the tympanum, although sometimes the sensibility to sounds is increased.

In most cases, however, facial paralysis is not connected with cerebral mischief, and may result from severe cold.

8th Pair. **Glosso-Pharyngeal, Pneumogastric, Spinal Accessory.** The parts supplied by these nerves are so numerous, and the functions they perform are so diversified and complicated, that it is impossible to embrace the consequences of their injury in a brief summary, but it will suffice to state that—

Paralysis affecting the pharynx, which occurs as a sequel of diphtheria, is undoubtedly glosso-pharyngeal.

Paralysis of the glosso-pharyngeal, together with the pneumogastric, occurs in various cerebral affections which produce deep coma, causing impairment and loss of power of deglutition, with diminished frequency of respirations.

The nerve supply of the larynx being derived from the laryngeal branches of the pneumogastric, lesions of these branches may lead to serious disorders of the larynx.

The spinal accessory, according to Bernard, "presides over the vocal functions of the larynx and thorax; by its accessory, or inner, portion over those of the larynx; by its outer, or spinal, portion over those of the thorax."

By paralysis of the accessory portion Aphonia results.

By paralysis of the spinal portion, the voice is confined to the duration of an ordinary expiration, and the sound dies off in a kind of sentimental whine towards the end of the expiratory movement.

In the so-called **glosso-labio-pharyngeal paralysis**, the essential lesion is in the medulla oblongata and the upper part of the spinal cord, and is associated with atrophy of the nerve-cells in connection with the origin of the hypoglossal, pneumogastric, and spinal accessory nerves. The results are a gradual but steady diminution of power in the muscles of the soft palate, pharynx, tongue, larynx, and orbicularis oris. The causes of the disease are unknown, but it always ends fatally, from asphyxia, or cessation of the action of the heart, by the cells of the pneumogastric becoming involved.

9th. **Hypoglossal.** This is the great motor nerve of the tongue. If paralysed on both sides, although this event is rare, it is impossible to protrude the tongue, which hangs down as a helpless mass. When paralysed on one side only, the tongue, when protruded, often deviates to the paralysed side.

Articulation, mastication, and the first act of deglutition, viz., bringing the successive portions of food between the teeth, are all impaired.

TREATMENT OF PARALYSIS.

This must, in the first place, depend in a great measure upon the particular kind of paralysis and its causes, whether it be due to some toxical agent, as arsenic, copper, or mercury, or whether it be functional, due regard being paid to the state of the system, as concerns nutrition, debility, or anæmia. In the second place, the treatment will have reference directly to the paralysis, its object being to rouse the functions of the paralysed parts, to promote circulation in them, and, as far as possible, secure their healthy nutrition, such remedial measures being friction by stimulating embrocations, shampooing, electricity, passive move-

ments, strychnia, and especially active exercise under the influence of the will.

In **Hemiplegia**, even when the case is seen early, the mischief is already done; but benefit may be anticipated from aperients and *cathartics*, especially scammony and jalap combined with calomel, or by stimulating purgative enemata. Blisters to the scalp or nape of the neck have also been employed with advantage: alterative doses of mercurials and iodide of potassium may be tried. When the paralysis becomes chronic, *strychnia*, since it acts as a stimulant to the paralysed parts, may be given in small doses, as the $\frac{1}{20}$ or $\frac{1}{30}$ of a grain.

Local Stimulation may be employed with occasional benefit, as friction with the hand or flesh-brush, and stimulating liniments of ammonia, turpentine, croton oil, and tincture of cantharides.

Galvanism and *Electricity* have been used with benefit in some cases.

In **Mercurial, Cupric, or Lead Palsy**, the sufferer must be removed from the vitiated atmosphere, and the treatment should comprise warm baths, good diet, sea-air, and *iodide of potassium*.

It is asserted that lead and mercury exercise their injurious effects by chemically combining with the tissues of the body, or by existing in intimate union with those tissues in some analogous manner; it was, therefore, pointed out that the poisonous metal must be converted into a compound having less affinity for the tissue, and which may consequently be readily eliminated from the body. According to this theory, it has been shown that iodide of potassium possesses the requisite qualities to become a curative agent in diseases induced by lead or mercury.

Warm baths should be given, exercise in the open

air enjoined, and friction should be applied to the paralysed limb.

Sulphuric acid lemonade has been recommended in lead poisoning, since the acid probably converts the lead into an insoluble sulphate.

In **Infantile Spinal Paralysis** absolute rest is imperative; fever symptoms must be combated with saline aperients and other appropriate remedies. A few leeches to the spine or counter-irritation by vesicative liniments may prove of service. Subcutaneous injection of ergotine has been recommended, since this alkaloid is stated to control hyperæmia by contracting the small vessels of the spinal cord. Belladonna also controls hyperæmia of the cord and its membranes. Iodide of potassium in small doses, combined with some vegetable infusion, may prove useful. Quinine, iron preparations, and strychnia, are also considered beneficial. The affected limb should be exercised daily, and friction should be employed constantly. When the paralysis is advanced, no benefit can be expected except from faradisation and galvanism.

The continuous current should be applied to the affected muscles at first two or three times a week, and eventually more often. It should be used for about a quarter of an hour at a time, increasing the power of the current by degrees, as improvement results. After a time the induced or Faradaic current may be used in place of the continuous variety.

This form of paralysis is sometimes very chronic and obstinate, and the treatment has been continued in some cases for months and years. The apparently most hopeless cases may recover completely under proper local and constitutional remedies. The warmth of the affected muscles may be maintained by enveloping them in stockings of "chamois leather" or "pure spun

silk." In some cases the seaside or mountain air is valuable.

In the **Paralysis of Duchenne** the treatment is very unsatisfactory, and can only be palliative; friction, galvanism, and methodic muscular exercises may be tried. Internally, cod-liver oil, phosphorus, and arsenic preparations may be exhibited.

ANÆMIA OF THE BRAIN.

Symptoms.—There may be giddiness, buzzing, and ringing in the ears, faintness, pallid look of the face, and loss of consciousness in mild forms; but the severer forms may result from sudden hæmorrhage, and may be accompanied by coma and convulsions. The pupils are at first contracted, then dilated, and lastly, if the issue is favourable, they may be normal. Death from sudden shock is often attributed to cerebral anæmia.

Pathology.—A pale colour of the brain is found most conspicuous in the grey matter, but also causing the white substance to look paler than usual. The normal quantity of red points (puncta cruenta) is diminished, and the amount of blood in the vessels is decreased.

Treatment.—The patient should be kept in the horizontal position; wine and nourishing soups should be given, and all mental excitement avoided.

HYPERÆMIA; OR, CONGESTION OF THE BRAIN,

Varieties.—Of this affection two may be recognised, viz. :—

(1) Active Congestion, characterised by an increased amount of arterial blood; and

(2) Passive congestion, in which the venous blood is in excess.

Causes.—The *Active* form may result from exposure to the rays of a powerful sun, or from blows or falls on the head; excessive fatigue or excitement may produce it in persons already predisposed to the affection.

The *Passive* form results from any obstacle to the reflux of venous blood from the brain, such as the mechanical obstruction produced by an enlarged thymus gland, or by enlarged bronchial or cervical glands, or by the pressure of a thrombus in a large vein or sinus, producing complete or partial occlusion in these situations.

It may also occur in such affections as whooping-cough, which are accompanied by severe paroxysms of cough, and during which the return of venous blood from the brain is obstructed. A languid, feeble circulation resulting from deprivation of pure air, or from insufficient or non-nutritious food, strongly predisposes, if it does not absolutely induce, the condition.

Symptoms.—*Active* congestion appears suddenly, but it may be preceded for a few days by irritability and disordered bowels. The leading symptoms are intense heat of head, headache, intolerance of sound and light; startings in sleep and muscular twitchings may take place. The pulse is rapid, and there is throbbing in the carotids. If no relief can be given to these symptoms,

stupor or coma may supervene, or convulsions may ensue. The pupils are generally dilated, the eyes wear a vacant expression, or they are fixed with difficulty upon the same object.

In the *Passive* form the symptoms are usually developed less suddenly; but when their character is marked they closely resemble those just described. The fever symptoms, however, and the carotid pulsation are far less marked.

When great vascular distension only is present, the symptoms may subside in two or three days, but when the congestion has been so intense as to produce serous effusion or small extravasations of blood (capillary hæmorrhages), the symptoms may assume a graver aspect, death resulting; or the attack declines, more or less paralysis remaining. In some cases, however, complete and unlooked-for recovery takes place after the grave symptoms have continued for many days, or even weeks.

Pathology.—In the *active* form, the size of the capillaries and the large blood-vessels of the brain and of the pia mater is increased. The puncta cruenta are increased in number, and are larger than usual. The pia mater appears red or rose-coloured, either throughout its entire extent, or in spots. The hue of the grey matter is violet or red. Fluid in excess is contained in the ventricles, and there is enlargement of the choroid plexuses. In the *passive* form, the veins are usually distended, since the amount of venous blood is increased.

Treatment.—This really embraces the general treatment of meningitis. Cold may be applied to the head; aperients, and full doses of bromide of potassium may be exhibited. The diet should be low, and the patient placed in a dark, cool room.

Small doses of belladonna preparations may be administered. Lastly, in some cases, a few leeches may be applied to the scalp, and active purgatives, as calomel, croton oil, and jalap, may be exhibited.

CEREBRAL THROMBOSIS AND EMBOLISM.

Description.—When a vessel of the brain becomes obstructed by a clot and this clot is found nearly at the point occluded, the term "Thrombosis" is used. When, on the other hand, the obstruction is due to some substance which is carried away from a remote part of the system and located at the spot of obstruction, the term "Embolism" is given. The result of the obstruction, no matter how produced, will be defective nutrition of the particular spot, with softening and abolition of the functions of the parts which are thus robbed of their nourishing blood supply.

Symptoms.—In Thrombosis, the symptoms are developed slowly, and the preceding indications are pains in the head, loss of memory, confusion of ideas, and possibly numbness and tingling. Thrombosis is generally associated with feeble action of the heart, and with advanced age. In Embolism the onset is sudden. There are no warnings, but speedy giddiness, an involuntary cry, and immediate unconsciousness. Valvular disease of the heart is almost always present. In either case hemiplegia may result, or the tongue alone may be paralysed, or the faculty of speech merely lost.

APOPLEXY (ἀποπλήσσω, I strike).

This term is expressive of a symptom, viz., a sudden stroke or beating down, and which is a prominent indication of three affections of the brain; viz., Thrombosis, Embolism, and Cerebral Hæmorrhage.

Varieties.—Three were at one time described; viz.:

(1) Simple or Congestive, *without* rupture of a vessel.
(2) Serous, with serous effusion.
(3) Hæmorrhagic or Sanguineous, or Congestive, *with* rupture of a vessel.

These varieties are not now so frequently made use of, but the various clinical features are considered under the term of "an apoplectic seizure."

Modes of Invasion.—(*a*) A sudden falling down without warning. (*b*) A short premonitory stage, accompanied by sickness, faintness, and severe headache. (*c*) With sudden hemiplegia.

Symptoms.—There is complete insensibility, the breathing is stertorous, the face livid, the pupils either dilated or contracted, or one dilated and the other contracted, the urine and fæces may be passed involuntarily, the pulse is usually full, strong, and quick, but occasionally less frequent than natural. Reflex action may be induced by tickling the soles of the feet.

Terminations.—(1) In sudden death. (2) In death after a variable interval. (3) In complete recovery, usually preceded by profuse perspirations and vomiting. (4) In partial recovery, the mind being more or less impaired, and the paralysis more or less extensive.

Pathology.—In the *Congestive* form there is a general pink hue of the brain substance, with distension of the vessels, especially of the veins, which are sometimes

enormously engorged, and the puncta vasculosa are increased in number.

In the *Serous* variety there is a simple effusion of serum in the ventricles, usually of considerable amount.

In the *Hæmorrhagic* or *Sanguineous* form there is effusion of blood from some ruptured artery. The following is the order of frequency in which the effusion occurs: First, in the corpora striata and optic thalami; then in the lobes of the cerebrum; then in the pons varolii (in which case the pupils are contracted); and finally, in other parts of the encephalon. The effused blood dislodges a part of the cerebral substance, and occupies the cavity so produced. If a fatal result does not take place, the serum of the extravasated blood undergoes absorption, contraction and degeneration of the fibrin and red blood corpuscles takes place, the cavity contracts, and ultimately a cicatrix is formed, in which the remains of the clot are inclosed.

Thus there is often evidence of a previous attack: viz., a recent clot with circumscribed inflammatory softening of the surrounding nerve substance, or there may be an old contracted colourless clot containing blood crystals, or a small cicatrised cavity containing serum.

Causes.—These may be divided into Remote and Proximate.

Remote causes are: A certain age (from the 50th to the 80th year). A peculiar configuration of the body, such as a short, thick neck, a ruddy complexion, and obesity; but it must be borne in mind that the subjects of apoplexy have sometimes been of an opposite nature. Hereditary tendency, sedentary habits, deep study, and gluttony also predispose to apoplexy.

Proximate causes are: Diseases of the cerebral vessels, as fatty degeneration, atheroma, and calcification, the coats of the vessels losing their contractility and elasticity, and hence becoming liable to rupture.

Treatment.—The great point is to obviate the tendency to death. *Bleeding* generally should be avoided, except in cases where there is a liability to death from coma, the pulse being full, hard and thrilling, the vessels of the neck congested, and the face flushed and turgid.

In any case, the patient should be placed in a cool, well-ventilated room; the head should be raised, and all tight parts of the dress loosened, especially about the neck. Pounded ice in a bladder may be applied to the head.

Active purgatives generally do good. If the patient is able to swallow, a full dose of jalap and calomel may be given, followed by a black draught; if unable to swallow, a drop or two of croton oil may be placed upon the tongue. Stimulating enemata should also be thrown into the rectum. Subsequently, blisters may be applied to the neck or scalp.

When predisposition is suspected, all strong exertion, violent emotion, straining or stooping, too much sleep, and warm baths should be avoided. A cool, spare diet, free from alcohol, with regular and free purgation, should be employed. A purgative should be given from time to time if such symptoms arise as giddiness, drowsiness, faintness, dimness of vision, numbness of limbs, or singing in the ears.

A person may be found in an unconscious state, which resembles an apoplectic attack; and it is a matter of great importance that the actual condition should be

accurately recognised. The unconsciousness may be caused by narcotic poisoning, epilepsy, drunkenness, uræmia, or by concussion from a blow or a fall. The history is of great importance.

In *narcotic poisoning* the pupils are usually contracted. There is no hemiplegia, no remission in the insensibility, but there is increasing coma.

If resulting from *epilepsy*, the duration of the attack will not be long, and there will be a history of previous attacks.

In *drunkenness* it is possible to arouse the patient to some extent, since the insensibility is not complete. There is no hemiplegia, and the smell of alcohol may be detected in the breath. It must not, however, be forgotten that an apoplectic attack and drunkenness may coexist, and that therefore a very careful opinion must be given.

In *uræmia*, hemiplegia is absent. Upon drawing off the urine, this fluid will be found to be albuminous, and probably dropsy will be found in various parts of the body.

With *concussion*, there may be bruises or injuries on other parts of the body, possibly bleeding from the nose or ears, and other indications of the insensibility arising from accident.

EPILEPSY (ἐπίληψις, ἐπιλαμβάνω, to seize upon), FALLING SICKNESS,

May be defined as a malady characterised by fits occurring at irregular intervals, with sudden loss of power and motion, attended by convulsions, and usually followed by deep sleep.

Symptoms.—The patient usually falls down, uttering a piercing shriek, immediately afterwards becoming

violently convulsed and senseless. The face is at first pale, but it afterwards becomes congested, flushed, and much distorted; there is gnashing of the teeth; the pupils are *dilated* and insensible to light; there is foaming at the mouth, the tongue is thrust forward, and often bitten; the breathing is laborious; by degrees these urgent symptoms abate, and are followed by insensibility, and apparently deep sleep, or a comatose condition, from which the epileptic recovers exhausted and entirely ignorant of what has taken place. The convulsions are at first *tonic*, but they afterwards become *clonic*; the urine and fæces may be expelled involuntarily; bruises are sometimes observed upon the body from falls, and severe burns have occurred from the patient falling into the fire.

The attack is sometimes preceded by *warnings*, such as headache, giddiness, dim vision, and the so-called *aura epileptica*, a sensation which has been differently compared to a stream of cold water, or a current of warm air, or the creeping of an insect, commencing in the extremity of a limb, and gradually ascending towards the head, and at the termination of which *aura* the epileptic paroxysm begins.

The attack is sometimes almost immediate, but at times many hours have intervened after the first warnings.

The mind gradually becomes enfeebled, and there is loss of physical and mental energy during the intervals. Epilepsy is more common in females than males after seven years of age.

Epileptic Vertigo is the name applied to an epileptic condition in which the unconsciousness may last only for a few moments, and in which there is no falling or convulsions; in fact, this condition corresponds to the "*petit mal*" of the French, in contradistinction to

the "*grand mal*" characterising a severe case of epilepsy.

Causes.—These may be divided into Centric and Eccentric.

Centric causes are: Tumours pressing upon the brain or any part of the nervous system; plethoric condition of the cerebral vessels; anæmia of the brain and spinal cord; a cystic form of tænia in the brain.

Eccentric causes are: The irritation of worms in the intestines, indigestible food, and dentition.

Epilepsy is often hereditary, and intemperance frequently predisposes to it; it is frequently observed in the children of intemperate parents.

Pathology.—Post-mortem examination very often reveals nothing more than congestion of the cerebral vessels; but, in some cases, thickening of the membranes and of the skull-bones, spicula of bone and internal nodes have been observed.

Treatment.—During the fit the patient should be placed in the horizontal position, and the tight parts of the dress loosened, a piece of wood or cork or a roll of linen being placed between the teeth to prevent the tongue from being bitten.

Cold evaporating lotions may be applied to the head. During the interval, the general health must be improved, and the laws of health strictly observed. Innumerable remedies have been advocated, and among them nitrate of silver in $\frac{1}{8}$ grain doses, gradually increased to 3 or 4 grains (objectionable, since it sometimes causes permanent blackening of the skin); oxide of zinc, from 6 to 8 grains, in divided doses, daily, after meals, increased 2 grains each week until 45 grains have been reached; sulphate, lactate, phosphate, and valerianate of zinc have all been recommended, and also the sulphate of copper, in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses.

Belladonna, in doses of from 1 to 5 grains of the extract once daily for a month, doubling the dose each month until the largest quantity is reached which can be conveniently borne, is held in high esteem by Trousseau.

Bromide of potassium, in large doses, undoubtedly wards off the attacks, but it is questionable if it cures the disease, although it certainly does good, and must be regarded as a most valuable remedy.

Strychnia, nux vomica, indigo, valerian, musk, camphor, and oil of turpentine have all been tried in cases of epilepsy.

CHOREA (χορεία, a dancing). **CHOREA SANCTI VITI. ST. VITUS'S DANCE,**

Is a disease specially characterised by loss of co-ordination of muscular movements. It has been quaintly termed "insanity of the muscles."

Symptoms.—The affection may appear suddenly, with irritability of temper, or disordered condition of the stomach and bowels. The patient is unable to remain still for any length of time; the head is jerked to one side; when standing, the foot shuffles and scrapes the floor: the walk is uncertain and hurried; the affected leg is not lifted in the ordinary manner, but is dragged along as if paralysed; the features are contorted or twisted in a comical manner; articulation is impeded; swallowing is performed hastily, and with ludicrous grimaces; these symptoms are aggravated when the patient is watched; when asked to show the tongue, the organ, after some hesitation, is protruded with a jerk, and then as suddenly withdrawn; when an attempt is made to raise anything to the mouth, it is sometimes jerked over the head, and frequently dropped as soon as it is laid hold of.

Both sides or only one side of the body may be affected; in the majority of cases the disease is limited to one side.

The specific gravity of the urine is markedly increased during the height of the attack, but declines as its severity diminishes.

The stomach and bowels are usually deranged, and there is often constipation; the appetite is generally capricious. This disease usually occurs between the ages of 6 and 15; it is more common in girls than in boys in the ratio of 3 cases to 1; it is seldom fatal or dangerous unless merging into disease of the nerve-centres or into epilepsy.

The duration of the affection may be from a few weeks to several months or years; the ordinary duration is probably about five to six weeks.

Chorea has been observed in conjunction with rheumatic fever and rheumatic affections of the heart, especially of the mitral valves.

Relapses are very apt to occur, but they are, as a rule, shorter in duration than the primary attacks.

Causes.—These are obscure: chorea is most common in the children of nervous and hysterical women; an attack may be caused by a blow, a sudden fright or a violent fit of anger, irritation of the spinal cord or its membranes, or any irritation of the nervous system; insufficient food is probably a potent cause, since proper nutrition is curative of the affection in many cases; anæmia, rheumatism, and the presence of intestinal worms, are said to induce the affection; and Dr. Hughlings Jackson believes that it may be caused by embolism of the cerebral capillaries, and of the small vessels by which the corpus striatum and the convolutions in its vicinity are supplied.

Chorea is often acquired by imitation.

Pathology.—Death has occurred, and no organic lesion has been discovered. The post-mortem appearances are rather those of the secondary affection by which death was caused than those of chorea itself. The vessels of the spinal cord may be congested, and blood is sometimes effused round the theca vertebralis. The cerebral meninges may be affected, and serous effusion be present. Softening of the brain and spinal cord has been observed.

Treatment.—A large number of remedial measures have been recommended in the treatment of chorea. If rheumatism is present, remedies addressed to this complication will be indicated, as the bicarbonate of potash or lithia; anæmia will demand iron preparations; the constipation must also be relieved.

Aperient remedies are exceedingly useful, as hydrargyrum cum creta and pulvis rhei, in doses according to the age, followed by castor oil, or some other simple aperient; more active purgatives may be employed if necessary.

Tonics are considered very useful, such as the carbonate and sulphate of iron, zinc, and strychnia; opium, cannabis indica, and various anti-spasmodics have also been advocated.

The author is inclined to believe that the most efficacious remedy is arsenic combined with iron, as the liquor arsenicalis, minims ii. or iii., with the ammonio-citrate of iron, grains v., the dose being increased according to the age.

Of a large number of cases under observation at the North-Eastern Hospital for Children, nearly every case recovered in about six weeks to two months under the last-mentioned combination; it is, however, only fair to infer, when so many remedies have been advocated as curing this affection, that chorea may terminate

favourably by an intrinsic tendency; and there can be but little room for doubt that the excellent nursing and discipline contributed in no small measure to the successful recoveries in the cases now referred to.

TETANUS (*τείνω*, I stretch).

Definition.—A functional affection, characterised by persistent stiffness of the muscles of the jaw and often of the greater part of the voluntary muscular system, with paroxysms of tonic spasms, the intellect being preserved.

Symptoms.—These are sometimes developed abruptly, but are sometimes preceded by vague premonitions, as a sense of fatigue, chilliness, etc. A sensation of stiffness in the neck is first complained of, which gradually increases, extending to the jaw, and involving the masseter and temporal muscles, causing **Trismus**, or *Locked jaw.* The remaining muscles of the face, those of the trunk, and eventually those of the extremities, become affected. Deglutition is prevented by the pharyngeal muscles being involved, foamy saliva collecting and escaping from the angles of the mouth. The spasms are persistent or *tonic*, never ceasing entirely, except during sleep in some cases; every quarter of an hour or so they are aggravated, the increasing cramp lasting for a few moments and then partially subsiding.

The body is frequently bent backwards, forming the arc of a circle, the patient resting upon the head and heels, producing the condition known as **Opisthotonos.** When the body is bent in the opposite direction by the strong contraction of the cervical and abdominal muscles, **Emprosthotonos** is produced; and when the body is curved sideways, from the muscles being affected laterally, the condition is termed **Pleurosthotonos**, or

Tetanus Lateralis. The face is pallid, the brows contracted, the eyes prominent and fixed, the nostrils dilated, the mouth drawn at the corners, the teeth exposed, and the features stiffened into a ghastly grin, forming the **Facies Tetanica**, or **Risus Sardonicus.** The respiration becomes embarrassed according to the extent to which the respiratory muscles are affected. The pupils have been observed to be contracted to a pin's point. The bowels are usually constipated, thirst is intense; the pulse is rapid and small, and the skin covered with cold, clammy sweat. The intellect, nevertheless, remains clear to the last.

The majority of cases terminate fatally, death taking place either by apnœa from the implication of the muscles of respiration, or from asthenia, due to the rigidity and spasms, and probably from the difficulty of alimentation.

The duration of the disease is from twenty-four hours to twenty days; the ordinary duration is probably about ten days.

Causes.—Tetanus is termed **Traumatic** when resulting from wounds, especially from contused wounds of the extremities; it may also result from injuries to the nerves or tendons by puncture or laceration.

Idiopathic tetanus is extremely rare, and arises spontaneously, or from exposure to cold or damp, and from excessive fatigue.

The symptoms of strychnia-poisoning resemble those of tetanus, and give rise to tetanoid spasms. The following table illustrates the differences between these affections:

Tetanus.	Strychnia Poisoning.
Gradual supervention of symptoms. Trismus the *earliest* and most *prominent* symptom.	*Rapid* supervention of symptoms. Trismus only existing *imperfectly.*
Facies Tetanica very characteristic. Opisthotonic attacks less frequent, severe, or extensive.	Facies Tetanica very slight or absent. Opisthotonos very active and violent.
Spasms *tonic* (persistent). Deglutition slow and difficult, sometimes impossible, the mouth being spasmodically closed.	Spasms *clonic* (intermittent). Deglutition perfect but peculiar, fluids being gulped down with an effort, in a similar manner to that in which hydrophobic patients swallow.

Pathology.—The post-mortem appearances of tetanus are not constant; there may be signs of inflammation in the spinal cord and its membranes (**Centric** tetanus), but sometimes these parts are quite healthy, some remote irritation, which is conveyed to the spinal cord and reflected on the muscles being then the cause of the disease (**Eccentric** tetanus). In Traumatic Tetanus there may be traces of injury to the nerves. Rupture of the muscles has been observed, these being engorged with blood.

The analogy of the phenomena of this malady with the symptoms produced by strychnia-poisoning point to the medulla oblongata as the seat of the affection.

Treatment.—This is for the most part empirical, but the following remedial measures have been tried; viz., Opium, tobacco, henbane, cannabis indica, alcohol to intoxication, chloroform inhalation, blisters to the spine,

the raw surfaces being dusted with morphia, ice to the spine, purgatives, as croton oil (one or two drops), turpentine, in one ounce doses, aconite, electricity (the continuous current), and quinine in large doses. Great quiet must be enjoined, light and sound being excluded, and all excitement avoided.

If the treatment were directed on what are termed *rational* grounds, it is probable the best remedies would be those which act as sedatives on the spinal cord, and are antagonistic to the action of strychnia, such as opium, chloroform, and cannabis indica.

TRISMUS NASCENTIUM, or TRISMUS NEONATORUM.

This is a very fatal disease, occurring in children chiefly in the first or second weeks after birth, and usually running an acute course. It is characterised by more or less general tonic contraction of the voluntary muscles, with paroxysmal exacerbations and no complete relaxation until the end of the disease.

Although tetanus generally occurs between three and ten days after birth, it has been seen in one case fifteen hours after birth, and in other cases not until the twelfth or fifteenth day. It is not common in this country.

Causes.—Certain morbid states of the umbilicus and umbilical vessels, blows and accidental injuries, vicissitudes of temperature, and exposure to wet and cold, favour its development. A vitiated atmosphere, arising from filth of the house or bedding, or imperfect ventilation, are other causes.

Pathology.—The characteristic appearances are observed only in the nervous system. There is frequently intense congestion of the brain and its meninges, and

also specially congestion of the spinal cord, even actual effusion of blood between the dura mater and the skull, into the arachnoid or into the ventricles. Instead of hæmorrhage, serous effusion has been found in the arachnoid space or in the ventricles, accompanied by diminished consistence of the cerebral substance. The morbid appearances in the spinal cord are similar to the above, only they are more marked and constant.

Microscopically, according to Demme and Rokitansky, the constant anatomical character appears to be proliferation of the connective-tissue of the cord, the striking peculiarity being the large area over which it extends. The product is a viscous mass with abundant nuclei, never advancing to a fibre-forming stage. The change is almost exclusively limited to the white medullary substance, the grey matter appearing merely to suffer secondarily. The proliferation is chiefly in the medulla oblongata, crura cerebri, inferior peduncles of the cerebellum, and in the greater part of the spinal cord.

Symptoms.—The onset of the disease is usually gradual. Difficulty in sucking is one of the earliest symptoms. The infant is anxious to suck, pressing the mouth eagerly against the nipple, but unable to perform the act in consequence of the rigidity of the masseter muscles, and simultaneously it utters a whining, whimpering, and unnatural cry. The muscular contraction soon spreads to the other facial muscles, and to those of the trunk and extremities. The expression indicates great suffering, and the infant wears an aged look; the characteristic *risus sardonicus* appears, and opisthotonos is frequently produced by the contraction of the dorsal muscles. During sleep there is generally a certain amount of relaxation. The slightest exciting cause, such as an attempt at swallowing, a sudden noise, a

puff of air, or a fly settling on the surface, may produce exacerbations of the tonic spasms. During the continuance of the fit the circulation and respiration are seriously interfered with. The skin may become livid, and bleeding from the nose may take place. In fatal cases the paroxysms increase in frequency, the child either dying suddenly during an attack or passing into a comatose condition.

The prognosis is very grave, and most authorities believe that recovery never takes place after a fully established case of trismus nascentium. The duration rarely exceeds forty-eight or seventy-two hours, and death constantly results on the first day.

Treatment.—This must consist in free ventilation and cleanliness, and care in dressing the umbilical cord. The occipital region should be examined to see if the occipital bone is depressed unnaturally, since this has apparently been an exciting cause in some cases. Leeches may be applied along the spine or to the nape of the neck. Among the numerous internal remedies are ether, chloroform, opium, chloral hydrate, belladonna, cannabis indica, aconite, conium, tobacco, and assafœtida. Sulphate of atropia has been administered hypodermically, the first dose being not greater than $\frac{1}{200}$ or $\frac{1}{150}$ grain; $\frac{1}{2}$ grain of the salt should be dissolved in 1 ounce of water, and 4 to 6 drops injected under the skin. Ice to the spine has been recommended. Milk, meat broths, and alcoholic stimulants should be given in small doses and often. Anæsthetics may be employed to relax the spasmodic muscular contractions, and so enable nourishment to reach the stomach, when the rigidity of the jaw and the spasms prevent every effort of deglutition.

DELIRIUM TREMENS. DELIRIUM A POTU.

Definition.—A condition of excitement with exhaustion, accompanied by trembling of the limbs and hallucinations of the senses.

The disease is sometimes termed Delirium Vigilans, in consequence of the wakefulness which is so constant a symptom.

Symptoms.—There are sleeplessness, *busy, suspicious delirium,* incessant talking or muttering, trembling of the hands, and an excited, eager manner.

The skin is usually covered with *copious cold perspiration;* the face is pale, but sometimes flushed. The tongue is moist, and *coated with creamy, white fur;* the head is *cool and sweating;* the pulse is small, rapid, and weak. In severe cases the quantity of phosphates is stated to be diminished in the urine. The phosphates are increased in Cerebritis, for which disease delirium tremens is sometimes mistaken. The patient is very suspicious, looking behind the curtains, under the pillow or the bed; fancies he is surrounded by enemies, or in a strange place, from which he is constantly attempting to make his escape. The hallucinations generally have reference to animals. The patient will listen to the arm of a chair, believing it to be a serpent or the lurking-place of a scorpion; he sees beetles, mice, and devils. The subjects of delirium tremens are seldom hurtful to others, but the disease appears to exhibit a mixture of cowardice and dread with delirium. The symptoms are sometimes so severe that patients have committed suicide during an attack. The disease is far more common in men than in women.

Causes.—The habitual abuse of alcohol (especially indulgence in ardent spirits), excessive use of opium or

other narcotics and sedatives; mental exhaustion; intense study; prolonged anxiety; sudden abstinence from the accustomed stimulant; all causes of debility; physical and mental shock.

Pathology.—The post-mortem appearances are very vague. There is sometimes hardening of the brain, with a slight increase of serum in the ventricles and subarachnoid space. The odour of alcohol has been detected in the serum of the ventricles.

Treatment.—The main points are to procure sleep and to sustain the strength, the prognosis being favourable according to the physical power of the patient. The plan usually adopted is the exhibition of opium in full doses, viz., solid opium, gr. ii. or iii., or tinctura opii, ½ drachm to 1 drachm, followed at intervals of one, two, or three hours by tinctura opii, m. xx., or 1 gr. of opium, until sleep is obtained; equivalent doses of other preparations of opium or morphia may be employed. To support the strength, the following articles may be given, viz., ammonia and bark, beef-tea, eggs and brandy, or the accustomed stimulant in gradually diminished doses.

Large doses of digitalis (½ oz. of the tincture) have been recommended, but since this drug acts as a depressant to the heart, it would appear to be almost contra-indicated in the treatment of a disease characterised by great depression.

Bromide of potassium, in large doses, is considered by some to be a very valuable remedy in the treatment of this malady, and inhalation of chloroform has been found advantageous. The patient should be carefully watched, windows being well barred, and all means by which he might injure himself should be removed.

It should be mentioned that, in cases where perfect reliance can be placed upon the attendants and upon

the construction of the building in which the patient is placed, a favourable result may be anticipated even without any drug medication, it being understood that alimentation and perfect repose are insisted upon, a slight amount of alcoholic stimulant being administered if unusually dangerous symptoms of depression and exhaustion arise.

DELIRIUM EBRIOSUM.

Drinking to excess sometimes occasions this form of delirium, which differs pathologically from delirium tremens, but may be sometimes mistaken for it. Here the delirium is active, sometimes violent, and sometimes hilarious; it is in reality a form of acute mania induced by cerebral congestion associated with the immediate effects of alcohol upon the brain, and may be considered a variety of Cerebritis. This condition is caused not by habitual alcoholic indulgence, but rather by a single protracted paroxysm of drinking. It lasts only for a short time, but may in some cases be followed by delirium tremens. The usual remedies demanded are purgatives, blood-letting and antiphlogistics, which measures are contra-indicated in delirium tremens.

Alcoholismus, Alcoholism, or prolonged, excessive, and habitual indulgence in alcohol, enters largely into the causation of numerous affections, as cirrhosis of the liver, fatty liver, epilepsy, gastritis, pyrosis, and other forms of dyspepsia, and diseases of the kidneys (Bright's disease); it indirectly favours the production of nearly every disease, by diminishing the resisting power of the system, and it also increases the fatality by lessening the capability of overcoming the tendency to death. The immoderate use of alcohol acts deleteriously upon the whole economy. In chronic alcoholism the powers

of digestion are impaired, the appetite is partially destroyed, the muscular system weakened, and the generative function decays. The skin and muscles become flabby. Pain in the back and limbs frequently occurs. The breath and the emanations from the skin have a characteristic odour. The perceptions are blunted, deterioration of the moral and intellectual faculties takes place, until at last the inebriate has but one desire in life, viz., to satisfy the morbid craving for alcohol. This condition constitutes the disease known by the name of **Dipsomania.**

Very little benefit can be expected from treatment unless the subject of chronic alcoholism be placed under the most careful supervision and all alcoholic stimulants forbidden; should, however, symptoms of great depression supervene, it will be advisable to give small doses of brandy, or whisky, or the accustomed stimulant from time to time. During the author's connexion with an establishment for the cure of those who *voluntarily* placed themselves under restraint, it was found that the only chance of benefit depended upon the removal of every form of alcohol; under this measure nearly every case recovered for a time, but as soon as any form of alcohol was tasted the patient usually relapsed into his former habits and became frequently worse than ever.

Bearing in mind the misery and degradation accruing to the dipsomaniac himself, and the trouble resulting to his relations, friends, and others with whom he may come in contact, it is to be hoped that the time is not far distant when the legislature will adopt some stringent measures for the legal care and treatment of such unhappy inebriates.

CATALEPSIA. CATALEPSY.

A condition characterised by sudden loss of consciousness and volition, with fixation of the muscles in the same position in which they happen to be at the moment of seizure.

This is an exceedingly rare disease, and the essential features are a fixing of the body in the position it may happen to be in at the time of seizure, accompanied by complete unconsciousness. The statuesque condition may last only for a few moments, or for several hours, or even for days. The causes are very obscure, and the same principles of treatment should be observed as in the treatment of epilepsy and hysteria, to which diseases catalepsy is in all probability allied. Hysterical patients sometimes simulate the cataleptic state.

PROGRESSIVE MUSCULAR ATROPHY.

CREEPING OR WASTING PALSY.

Definition.—Atrophy and degeneration of groups of muscles.

Symptoms.—This disease usually commences in one of the upper extremities, usually the right. At first it is generally limited to a certain number of muscles. In the majority of cases the muscles of the hands are primarily affected, atrophy of the muscles of the ball of the thumb and the interosseous muscles being involved. In other cases the muscles of the shoulder, of the arm or the forearm first become atrophied; the affection by degrees extends over the whole muscular system, and even the muscules of the trunk may become atrophied. The diaphragm and intercostal muscles may become involved and death occur by apnœa, or the muscles of

deglutition may be included and death result from inanition. In some cases the appearances are characteristic; one scapula may be covered by muscles, but the other may be conspicuous, its boundaries being distinct and the spinous ridge projecting.

Pain of a neuralgic character may precede or accompany the affection, but it is not usually severe. The affected parts are extremely sensitive to cold. Quivering motions (fibrillary cramps) of the enfeebled muscles have been observed; these motions are quite irrespective of the will of the patient, who may be even unconscious of them. The mental faculties remain intact. The affected muscles lose their electro-contractility in proportion as they become atrophied and degenerated, while the unaffected muscles respond fully to the electrical current. The progress of the disease is slow and the prognosis very unfavourable, but recovery has taken place in a few instances. The mean duration is about one year.

Causes.—These are obscure. It rarely occurs under adult age. Males are more often affected than females. It has been supposed to be due to excessive muscular exertion. In many instances, several members of the same family have been sufferers from the affection, but it appears to have no connexion with particular occupations or social condition.

Pathology.—Post-mortem examination shows that the muscles are more or less diminished in volume. They are pallid, and microscopically their fibrillæ are reduced to half or one-third their normal size. The transverse striæ are diminished or lost, the proper muscular substance is replaced by molecular granules, the myolemma may be found devoid of contents, and mingled with the affected fibres are those which have undergone little or no change.

Treatment.—The great indication is to arrest the progress of the disease. All undue exertion should be avoided, but a certain amount of exertion is advantageous. Friction, shampooing, and stimulating embrocations must be applied to the muscles to promote their nutrition and circulation. Duchenne considers the induced electrical current exceedingly valuable, and Remak asserts that the constant galvanic current applied to the inferior cervical ganglion has been attended with happy results. Measures tending to invigorate the powers of the system are specially indicated.

APHASIA.

Definition.—A simultaneous loss, in greater or less degree, of the memory of words, of the memory of acts by means of which words are articulated, and of intelligence.

Symptoms.—The voice is not lost, as in *Aphonia*, but the patient cannot speak, from inability to use words expressive of his ideas. The loss of language is sometimes complete, at other times only impaired. The patient cannot recollect words, although their meaning is understood when uttered by others, and there is inability to co-ordinate the movements involved in the utterance of language. Amongst the recorded cases of aphasia, to whatever question asked, one patient invariably answered "No," although he showed plainly by his gestures and demeanour that he perfectly understood the question, but was unable to answer properly. Another patient always added the monosyllable "tif" to every word he uttered; another, when asked to write down what had happened to him, repeatedly wrote "was, was, was," and, when asked where he was

born, repeated "alone, alone, alone," although, by his impatient gestures, he plainly evinced that he knew he was not answering as he wished.

Dr. Saunders recognises two forms of aphasia:—

1. **Amnesic Aphasia**, or loss of speech, dependent upon defective memory of words. In this form there is inability to write.

2. **Ataxic Aphasia.** Loss of speech, due to a lesion of a supposed cerebral apparatus of co-ordination for the movements of articulation. In this form there is ability to write.

Aphasia frequently follows apoplexy, but not always, and it may occur in cases of hemiplegia not preceded by apoplexy; it may also occur independently of paralysis.

In the large majority of cases, there is paralysis of the right side of the body. Trousseau states that softening of the brain is often present.

Causes.—These are obscure. Apoplexy often precedes. From the frequent occurrence of cardiac murmur, Hughlings Jackson thinks aphasia may be due to embolism of the middle cerebral artery.

Pathology.—This is also obscure, and will depend very much upon the causation. According to Flint, one case, on post-mortem examination, revealed "an apoplectic cyst, with the remains of a clot, of the size of a hazel-nut, situated in the convex and superior surface of the left hemisphere, in the third convolution, just outside the longitudinal fissure."

Broca states that the organ of language is the posterior part of the third left frontal convolution, which he, therefore, calls "the convolution of articulate language;" but it is exceedingly improbable that this faculty is seated only in one hemisphere, and not in the other, and how is the fact to be accounted for that

in a few cases the hemiplegia is on the left side, in which the right convolution would be involved ?

Treatment.—Blood-letting has sometimes been immediately followed by good results, but only in cases in which hemiplegia did not exist. When aphasia exists with hemiplegia, treatment can only be palliative; nature alone can bring on improvement, and, in all cases, this is only partial. The injury to the intellect is almost always permanent.

NEURALGIA.

Definition.—Pain in a nerve trunk, unaccompanied by inflammation or any appreciable structural change.

Symptoms.—There is severe pain in the trunk or branch of a nerve, occurring in paroxysms at regular or irregular intervals; the nerves of the head, trunk, or extremities, may be attacked, the subcutaneous nerves of these parts suffering the most frequently.

Neuralgia may develop itself very suddenly, but there are generally premonitions, such as a feeling of weight, dull pain or heat in the seat of the affection; the pain may vary in intensity and in duration; it may terminate in a few hours or continue for years. It is generally referred to some particular spot or spots, which are usually tender on pressure. Pain may be relieved by pressure with the open palm, but by pressure with the ends of the fingers it may be rendered very acute. The pain frequently shifts from one nerve to another.

Neuralgia affects both sexes in about an equal degree, females being more subject to intercostal neuralgia, and males to sciatic neuralgia.

Causes.—Debility following prolonged lactation; exhaustion from loss of blood; long continued and excessive discharges; anæmia; malaria; irritation at the

root of the nerves supplying the seat of pain; spicula of bone irritating the nerve trunk; inflammation of the neurilemma; lead-poisoning. Neuralgia may be sometimes sympathetic, as in the case of pain in the shoulder from affections of the liver, pain in the foot from piles. The following forms of neuralgia have received special names, viz. :—

Neuralgia Faciei, Tic Douloureux, or Facial Neuralgia.—In this form either of the chief branches of the fifth pair of nerves may be affected; when the first, or *ophthalmic branch*, is the seat, the supra-orbital branch is most often attacked, the pain being chiefly referred to the forehead; when the second, or *superior maxillary branch*, is the seat, the infra-orbital nerve is usually affected, agonising pain shooting over the cheek and upper lip, alæ nasi and lower eyelid. In the case of the third, or *inferior maxillary branch*, the affection is usually confined to the inferior dental nerve, and to that portion especially which emerges from the mental foramen and passes to the lower lip; the pain is then referred to the lower lip, the teeth, the alveolar process, the side of the tongue and the chin. The pain is generally limited to one half of the face. It usually commences very gradually, as a fleeting twinge, but soon becomes more severe, being burning or stabbing and often excruciating. The attack is often preceded by nausea and gastric disturbance, sometimes by dyspnœa, and occasionally by slight rigors. Tic douloureux may be caused by decayed teeth, or disease of the bones of the face, or by organic lesions of the brain. It is frequently an accompaniment of hysteria, and may be intermittent, in which case it is apparently due to malaria. It frequently is dependent upon disordered digestion. The most trifling causes may excite a paroxysm of neuralgia in a person subject to the complaint, such as a sudden

jar, or a current of cold air, a fit of sneezing or coughing. Sleep may be prevented by the pain, but when the patient is once asleep the pain is suspended.

2. **Hemicrania, or Headache affecting one Side of the Forehead and Brow.**—Here the attacks are sometimes periodical, occurring at a certain hour each day. It is often attended by sickness, and frequently results from debility. From the fact that hemicrania, as a rule, only remains during the time the sun is above the horizon, this variety has sometimes been called *Sun Pain.*

3. **Sciatica.**—In this form there is a sharp pain in the course of the great sciatic nerve, spreading from the sciatic notch, down the posterior part of the thigh to the popliteal space, and often down the nerves of the leg to the foot; it may be caused by pressure upon some part of the nerve, or may be connected with rheumatism, or ordinary inflammation. One limb only is usually affected.

Treatment.—The first indication is to remove the cause of the pain. The general state of the health must be considered. If the patient be plethoric (an uncommon event), recourse must be had to purging and depletive measures. Debility must be counteracted by ferruginous tonics and generous diet. At one time the sesquioxide of iron used to be given in ½ to 1 drachm doses or more two or three times a day, with an occasional aperient. If the digestive organs are at fault, antacids are indicated; in rheumatic cases, iodide of potassium, guaiacum, colchicum, and sometimes turpentine. If the attacks be periodic in character, which they usually are, quinine, arsenic, bark and aconite tincture will be required. Narcotics and sedatives are generally necessary, but are often ineffectual. Any foreign body pressing on a nerve, a carious tooth or necrosed

bone, must be removed. Local applications are often useful, as belladonna extract and aconite ointment; chloroform is an exceedingly valuable remedy, ease continuing long after the patient has recovered from the immediate effects of the anæsthetic. Hypodermic injections of morphia are sometimes very useful, commencing by the use of not more than half the stomachic dose for males and not more than one-third for females. The actual cautery along the course of the affected nerve has been recommended by Valleix.

The most efficacious internal remedies are arsenic, the preparations of iron, and zinc (especially the valerianate of zinc), and iodide of potassium. Quinine is a most valuable remedy, and may sometimes be given in full doses, from 15 to even 30 grains daily to an adult, continued for a week or ten days. The author has observed this remedy, in one or two cases, to act like magic, the pain entirely ceasing within a quarter of an hour after the administration of a dose of 10 grains.

CEPHALALGIA. HEADACHE.

Symptoms.—Headache is a common symptom in most acute and in many chronic diseases, but it is sometimes so predominant over the other phenomena as to become a disease *per se.* It is distinguished from neuralgia by the pain not following the direction of certain nerve trunks, and from hemicrania by not being limited to one side of the head, but often involving the whole scalp. Cephalalgia is exceedingly common. It is usually paroxysmal, lasting from 12 to 24 hours, and may vary in degree, being sometimes dull and aching, at other times most intense and lancinating. It is reason-

able to suppose that headache is due to some unknown toxical agent in the blood.

Varieties.—1. **Cephalalgia Plethorica.**—Plethoric headache with fulness of the blood, congestion of cerebral vessels, giddiness on stooping, and pulsation in the ears, chiefly observable in those who live very freely, and in plethoric young women whose catamenia are irregular.

2. **Cephalalgia Dyspeptica, Sympathetica, Bilious,** or **Sick Headache.**—This may be *temporary*, arising from errors in diet, excess in wine, or in eating; it either disappears as the cause ceases, or it may be *constant*, occurring in persons of weak stomachs who are constantly troubled with nausea, although actual vomiting seldom takes place.

3. **Cephalalgia Nervosa.**—Nervous headache, resulting from exhaustion and debility, sometimes caused in women by over-lactation and sometimes intermittent: it is often known as **brow-ague.**

Treatment.—This will in a great measure depend upon the cause. In the **plethoric** form, it will be advisable to adopt depletory measures, and to administer active purgatives. In the **dyspeptic** variety, soda, rhubarb, and magnesia are the appropriate remedies, followed by tonics, as nitro-hydrochloric acid, quassia, calumba, etc. In the **nervous** form, quinine, nux vomica, arsenic, and belladonna, in small doses, may be given; valerianate of zinc is also especially valuable. During the paroxysm, carbonate of ammonia and saline aperients are occasionally serviceable. Evaporating lotions—alcohol, spirits, vinegar, a towel or napkin wrung out with water as hot as can be borne, and wound round the head—sometimes afford marked relief. Strong coffee or tea is often very useful.

VERTIGO

Definition.—A sudden attack of giddiness.

Symptoms.—A patient apparently in good health, or suffering from no definite malady, suddenly becomes giddy, all objects appearing to turn round, or he himself appears to be performing gyratory movements. If the attack be slight he may only walk unsteadily or reel as if drunk; if more severe, he may be quite unable to stand without support. Nausea and vomiting sometimes occur, accompanied by great prostration.

The duration of the affection is variable; it may last from a few moments to several hours or days. The intervals between the attacks are subject to much variation, and they may in some cases be produced by trifling causes, such as an intellectual effort, a sudden muscular exertion, looking upward, or a bright light. The patient may sometimes feel no distress whilst in the recumbent position, but the vertigo may commence directly he attempts to sit or stand. Although this affection gives rise to much apprehension of impending attacks of paralysis, apoplexy, epilepsy, or some grave malady, this fear is generally entirely groundless, and no uneasiness need be felt beyond the distress of the attacks themselves.

Causes.—Deprivation, hardships of various kinds, dyspepsia; over-study; mental anxiety; abuse of tobacco. Vertigo may also be incidental to the debility following convalescence from a severe disease, as typhoid fever.

Treatment.—If possible the cause should be removed. The principal indications are, tonics, nutritious diet, and all measures by which the general health may be

invigorated. Much good may be done by assuring the patient of the positive absence of all cause for apprehension.

HYSTERIA.

Definition.—This is an affection of the nervous system, in which there is a morbid susceptibility to emotions, with a defective power of the will to restrain their manifestations.

To define hysteria is a matter of some difficulty, since by it almost every disease may be simulated, but it may roughly be stated to consist in a disease of the nervous system, which often assumes most diversified forms, usually of a paroxysmal nature, associated with a considerable flow of limpid, colourless urine (diabetes insipidus), a sensation of a ball or globe in the throat (globus hystericus), sometimes accompanied by a sensation of suffocation, or even by convulsions and rumblings in the left iliac region (borborygmi). It especially affects females from the time of puberty to the decline of life, and chiefly those in whom great susceptibility of the nervous system and of mental emotion is well marked.

Causes.—Among the *predisposing* causes are: the female sex, celibacy, studious and sedentary life, mental anxiety, grief, disappointment, jealousy, the age from puberty to about the 55th year.

Among the *exciting* causes are dyspepsia, flatulence, suppression of menses or lochia, plethora, or anæmia, imitation or sympathy, tight lacing, spinal irritation.

It is rare in males, but may occur from extreme debility and mental irritation or exhaustion.

Although the influence of causes pertaining to the

sexual system has undoubtedly been greatly exaggerated, still the agency of excessive venereal indulgence, or masturbation, on the one hand, and of continence on the other, cannot be doubted. The hysterical constitution may be developed and fostered by the habit to which females are especially apt to become addicted, viz.: of unduly concentrating the attention on personal sentiments and sensations.

Hysteria may be divided into two—

Varieties.—1. The Hysterical Condition; and
2. The Hysterical Paroxysm.

In the HYSTERICAL CONDITION there is a morbid susceptibility to emotions, with defective power of the will. The patient may weep or laugh irrepressibly upon the most inadequate occasions, or may alternate these incongruous acts.

There is often a tendency to exaggerate symptoms of disease and to simulate suffering from extraordinary disorders. Other symptoms are a sense of constriction in the epigastrium and globus hystericus, cephalalgia, buzzing in the ears (tinnitus aurium), eructations, abdominal tympanites, diuresis, cramps and twitchings of the muscles. The hysterical state may be associated with innumerable other affections or symptoms, as aphonia, dry noisy cough, neuralgia, dysphagia, functional disturbance of the heart, functional paraplegia, apoplexy, hiccup, flatulence, dyspnœa, tetanus, paralysis, excessive sensibility (hyperæsthesia) of the body, or diminished sensibility to pain (analgesia) in portions of the cutaneous surface, syncope, brow-ague, and an extensive class of anomalous nervous affections, which frequently present a close resemblance to diseases of a more grave nature. In many cases, the state of mind

of the subject of hysteria is often bordering upon or associated with insanity, intense desire for sympathy being the great agent in the affection. In a case which came under the author's notice a few years ago, a woman was stated to have swallowed a large packet of darning needles, which were then presenting themselves beneath the surface of the skin in numerous parts of the body, viz.: the throat, abdomen, pudenda, back of the arms, etc.; it was, however, discovered, upon careful examination, that none of the needles could be found upon any parts of the body removed from the reach of the woman's hands; and it was therefore concluded that she herself had actually placed them in her skin. This opinion was eventually confirmed, she having put herself to all the pain and inconvenience for the purpose of enlisting the sympathy of the inhabitants of the parish in which she resided.

The Hysterical Fit or Paroxysm is usually preceded by a sense of uneasiness at the pit of the stomach, with nausea and flatulence, followed by yawning and sighing, depression of spirits, alternate paleness and flushing, copious shedding of tears, dyspnœa, and palpitation. There is acute pain in the side, about the flexure of the colon, with a feeling of distension, conveying the impression of a ball rolling about, causing the rumblings known as *borborygmi*, gradually rising into the stomach, and thence to the throat, in which it gives rise to the sensation of a ball or globe (*globus hystericus*). Suffocation now seems threatened, the nostrils are dilated, the abdomen tympanitic, the limbs strongly convulsed, and the head thrown back. There is beating of the breasts with the clenched hands, or tearing of the hair or the clothes, screaming and shrieking. Sometimes the patient sinks exhausted and insensible to the ground, remaining so for a time, and then recovers, crying and

tired; the expulsion of much limpid urine usually accompanies or follows the attack.

The above *fit* is distinguished from epilepsy, since it is peculiar to women. It lasts longer; the patient is cognisant of what is going on around her; there is seldom loss of consciousness; the convulsive movements are as much marked on one side of the body as on the other, and are much less severe, the tongue is not bitten, the respirations are never suspended, and the attack is not followed by coma or deep sleep. There is also a peculiar and characteristic trembling of the eyelids.

Treatment.—For the *hysterical condition*, remedies are required to tranquillise the nervous system, as valerian, assafœtida, musk, lactucarium, castoreum, ether, belladonna, sumbul, hyoscyamus, valerianate of ammonia or of zinc, and bromide of potassium in large doses. Opiates should be avoided.

Alcoholic stimulants must be recommended with great caution, in case the patient should resort to more than is desirable, and become habitually addicted to their abuse. Hygienic treatment is of paramount importance, such as abundant exercise, good diet, regular habits as regards sleep, and avoidance of all causes calculated unduly to develop the passions and sentiments.

Hysterical convulsions will end of their own accord, and it will be judicious in many cases to allow them to exhaust themselves. The application of the cold douche to the head is generally successful, this measure being continued until the patient declares herself better. After the cessation of the convulsion, an opiate by the mouth or hypodermically may be administered; but if they suffice, valerian, assafœtida, and ether are to be preferred.

During the hysterical paroxysm, the most efficacious measure is to dash cold water unsparingly upon the head of the patient and to place a tablespoonful of salt in the mouth. This plan has frequently stopped the most violent attack.

HYDROPHOBIA.

RABIES CANINA.

Definition.—A condition characterised by horror of liquids, difficulty in drinking, cramps in the muscles of the pharynx and thorax, restlessness and anxiety, delirium, exhaustion and death.

Causes.—The bite of a rabid animal, usually of the canine or feline race, as the dog, cat, fox, or wolf, produced by the inoculation of a special poison or virus which is contained exclusively in the fluids of the mouth.

Period of Incubation.—This is usually from 30 to 40 days after the bite, but is subject to considerable variation. It is probably rarely less than 8 or 10 days, and very rarely, if ever, exceeds one year.

There are strong grounds for distrusting the accuracy of the statements made of cases where the disease has very quickly followed the bite, or since which several years have elapsed. It is quite inconsistent with experience to suppose that the disease can be developed after the lapse of years, as stated by some authors.

Symptoms.—In some cases, premonitory symptoms are observed—as notable depression of spirits (the so-called "*studium melancholicum*"), restlessness, wakefulness, headache, chills, anorexia, nausea, and vomiting.

After the disease is fully developed, the most prominent symptom is laryngeal spasm, excited by the effort to drink water, which produces the most terrible dread of suffocation. There is also excessive secretion of saliva, and severe spasmodic convulsions of the whole body, arising even at the sight of liquids, or the sound of running water. It is frequently possible to swallow other liquids than water, such as spirits; pieces of ice are often swallowed without inconvenience. At first, the mind is simply excited, but subsequently delirium is developed. *Nymphomania* has been observed in females, and *Satyriasis* in males.

Termination.—In hydrophobia, there is an intrinsic tendency to death. It is doubtful if any well-authenticated case has ever ended in recovery. Death generally occurs on the second or third day, and always within five days after the full development of the disease. There are no anatomical characters.

Treatment.—No remedial measures have as yet proved successful. The most reliable prophylactic treatment is excision of the wound and cauterisation as soon after the bite as possible. Amputation of the fingers, toes, or larger members may even be advisable. Inhalation of chloroform, the use of prussic acid, opium, and ice may be resorted to, but with small hope of success; in fact, all that can be done is to palliate the symptoms as far as possible, with the exclusion of all controllable causes of physical and mental disturbance, the powers of the system being supported by alcoholic stimulation and alimentation.

MENIERE'S DISEASE.

By this term is implied a group of symptoms simulating intracranial disease, and including sudden vertigo, vomiting, a tendency to fall on one side, a staggering gait, noises in the ear, with deafness on one or both sides. These noises and deafness generally remain permanent; the remaining symptoms may pass off for a time, but usually recur, and after such recurrence the deafness becomes more complete. In consequence of the tendency to fall on one side and the vertigo, it was thought that the origin of this affection was some morbid change in the semicircular canals.* This disease is sometimes called "labyrinthine vertigo." It has, however, been shown that the phenomena of the affection may originate in certain morbid states of the external auditory canal and middle ear, especially from any pathological condition leading to abnormal pressure upon the labyrinthine fluid, such as undue pressure of the stapes upon the membrane by which the fenestra ovalis is closed. The treatment is, as a rule, very unsatisfactory. Large doses of bromide of potassium have been advocated.

CEREBRO-SPINAL MENINGITIS.

CEREBRO-SPINAL FEVER.

By this term is implied a peculiar disease which appears to consist in an inflammation of the meninges, and in some cases also of the substance of the brain

* The experiments of Flourens have indicated that the semicircular canals of the internal ear control the equilibrium of the body.

and the spinal cord. The origin is unknown, and its contagious nature is doubtful. The male sex, between the ages of fifteen and thirty, are chiefly affected, especially when there is crowding together during cold weather, as in barracks or workhouses.

Symptoms.—The attack comes on suddenly, and is characterised by prostration, severe pain in the head, rigidity and spasm of the lumbar and cervical muscles, and extreme sensitiveness over the entire surface of the body. At first the temperature of the body is abnormally low, and it never attains to any great height. The career of the disease is rapid, some cases proving fatal in a few hours, and the majority within twelve or twenty-four hours. There is frequently a peculiar petechial eruption upon the limbs, breast, and neck, of purple, red, or black hue, and varying in size from the diameter of a pin's head to that of three-quarters of an inch. About half the cases die.

Treatment.—Very unsatisfactory. Leeches may be applied behind the ears to mitigate the headache, and ice to the spine and head to relieve the spasm. Chloral, bromide of potassium, quinine and hypodermic injections of morphia, have been recommended.

IDIOCY AND IMBECILITY.

Idiocy may be defined as mental deficiency or extreme stupidity, dependent upon disease or malnutrition of the nervous centres, occurring either before birth or before the evolution of the mental faculties in childhood.

An idiot is a being who becomes irretrievably defective in mental power, and is incapable of co-ordinating

the functions of his brain, by reason of some cerebral abnormality existing before the brain has attained its full size, and the mind its full capacity.

Imbecility is a term generally applied to the condition in which the incapacity of the mind is less marked than in idiocy. The mental capacity of the imbecile is usually considered superior to that of the idiot. Imbecility is rarely congenital, idiocy nearly always so. The idiot is seldom so destructive as the imbecile, who often exhibits an amount of moral perception and sensibility far in advance of that which the idiot possesses and out of all proportion to his intellectual capacity.

Abnormalities of the brain may be due to:

1. Arrest of growth;
2. Arrest of development; and
3. Disease, viz., hæmorrhage into the cerebral membranes. The two former may be secondary to some diseases.

Backwardness and idiocy may be distinguished from the fact that in the former there is no unusual size or shape of the head, no fits, no spastic rigidity, and no paralysis. The idiot even in the slightest degree of the affection shows an arrest of development of mind and body. The child who is merely backward does not remain stationary, but his development proceeds more slowly than that of other children of his age; he is behind them in the whole course of their progress, and his delay, increasing day by day, at last places an enormous distance between him and them.

General debility and nervous exhaustion, as in recovery after acute specific diseases, may produce a temporary deficiency which may last a long time; and although usually recovered from, may in rare cases terminate in epilepsy and death. Cases of insanity

have followed whooping-cough, cerebral congestion, and intermittent fever.

Chorea of very long duration may degenerate into idiocy; but the stupidity which frequently accompanies choreic attacks is recovered from.

The following points are important in determining the condition of the brain of a child before it can talk.

1. A child's eye should follow a bright object or a bright light in two weeks after its birth; about the same time it should begin to smile. Squinting when objects are brought near them is natural to children under one month old, but not afterwards. It is no indication of brain disease, because the child at that age cannot adjust its eyes.

At three months old a child should begin to use its hands, and at the same period it should take hold; at four months old it should know faces; and from eight to nine months it should know objects by name.

From the earliest age, the tongue should be kept within the mouth. At three months the child should support its head. In this last particular idiots always fail. At from eighteen to twenty-four months the anterior fontanelle should close.

2. At from nine to sixteen months a child should begin to talk; at ten to eighteen months it should begin to walk; at nine months it should feel its feet when held out to walk. Mental deficiency is not necessarily indicated by deviations from this rule, since not unfrequently children do not walk until nearly two years old, and often do not commence to talk until about the same time.

At birth a child's brain should weigh $\frac{3}{4}$lb.; at the end of five years, 1·5lb.; and by the end of the seventh year, it should acquire its full size.

Smallness of brain may result from:

1, Deficient supply of blood; 2, meningeal inflammation; 3, effusion of blood in small quantities on the surfaces of the membranes.

Largeness of head may result from:

1. Simple thickening of bone, as occurs in rickets and idiocy; it is here secondary to idiocy, not causative of it.

2. Pure hypertrophy. No idiocy or other symptoms arise until the occurrence of compression.

3. Hydrocephalus, which is frequently accompanied by idiocy.

In all cases where idiocy exists, no matter what its cause, there is usually some bodily defect, such as arrested development, heart disease, fits, spastic rigidity, and shortening of some muscles.

Idiocy may be congenital or acquired; in the large majority of cases it is the former.

From the observation of 2,000 cases of idiocy, in 45 per cent. there were found well-marked neuroses in the families of one or both parents. If the neuroses were marked on the father's side, it was found that the later-born children were affected; if on the mother's side, the first-born children were affected.

Causes.—Scrofula and consanguineous marriages, especially if one or other parent proceeds from a scrofulous, syphilitic, or intemperate stock, are fertile causes of idiocy. It is stated that two-thirds of all idiots are scrofulous, as is indicated by the frequent occurrence in them of skin eruptions, otorrhœa, ophthalmia, suppurating glands, and strumous ulcers. Probably quite two-thirds of all idiots die of consumption; other causes are congenital malformations of the brain, severe fright, by which the brain-growth is arrested, injuries to the brain by falls or blows, epilepsy and convulsions, and probably in some cases masturbation. Fright to the mother during pregnancy is also considered causative.

To summarise briefly: The mind of the idiot remains undeveloped, except as regards a mischievous tendency; he can neither talk nor walk properly; he is frequently deformed, often deaf, and is unable to take hold of objects. Of the deformities the chief are: wad-shaped fingers, hernia, squinting, abnormal shortness of one or two toes in each foot, peculiar shapes of the ears, club-foot, and coloboma of the iris. The head may be unusually small (microcephalic), or unusually large (macrocephalic, or hydrocephalic). The hair on the pubes is usually scanty, and the testicles are at times wanting. The so-called "vaulted palate" commonly accompanies idiocy; in this case the palate is narrow, the height of the palatine arch increases at the expense of the nasal cavity, and the space between the bicuspid and molar teeth of opposite sides is decreased. If the narrowness is extreme, the teeth project beyond the upper lip. The lips of an idiot are nearly always thick and everted; the mouth is frequently large and gaping. The teeth generally are irregular and decayed, the saliva often dribbles from the mouth, and the gums are swollen. The skin often exhales a disagreeable odour; the habits are dirty, the passions are strong, the appetite is greedy, and there are frequently brutality and obstinacy.

CRETINISM

May be defined as an arrested development of the nervous system and bodily organisation generally, either before or after birth, due to a local cause, such as the condition of the soil, air, water, etc., and marked by characters which distinguish it from a state of mere endemic idiocy.

This condition is found most commonly in shut-up

valleys, in which the air is foul, the soil damp, and the inhabitants poor, dirty, and insufficiently or improperly fed. Water derived from lime sources is considered the chief causative agent. It is usually associated with goitre, although not necessarily.

Symptoms.—These generally appear in a marked degree about the sixth month, and are the following: The progress of growth of the body is very tardy; in some cases cretins are puffy, fat, and weak, although apparently healthy. The skin is sometimes of a brown colour, sometimes of an ashy-yellow. The head is often big, the fontanelles opened widely, and occasionally the sutures are disjointed, as in hydrocephalus. Cretins appear to open the eyes reluctantly. Their look is stupid and languid. The countenance continues always the same, altered neither by fear nor joy. They eat much and eagerly. Much of their time is occupied in sleeping, and they are not awakened with ease. The lips are swollen and thick, and usually gaping. The nose is short and broad. The cry is at times hollow and peculiar, and they seldom weep. The belly is swollen. The limbs are usually feeble and small. The neck is thick and large, and often the seat of goitre. The intellect is dull and apathetic. Dentition is always late in commencement, and generally goes on for several years longer than in the normal child, and is frequently associated with considerable salivation and alarming convulsions. The teeth are often irregular, blackening, decaying, and falling out. There is seldom ability to stand upright before the second or third year, and walking is scarcely accomplished before the sixth or seventh year. Speech is usually later than walking. After puberty the face of the cretin changes very little, and the cretinous face of 15 or 16 years old appears like that of a man or woman of 50 or 60.

The following differences between the cretin and the idiot must be borne in mind :

1. The idiot is born with deficient development. This affliction is organic and congenital, but the cretin for some time may seem free from disease, and under very favourable conditions may escape entirely.

2. Cretinism is of an endemic character, whereas idiocy is not at all so, but may appear without regard to locality.

3. Cretinism is far more curable than idiocy.

4. The "vaulted palate" is sometimes present in idiots, but in the cretin the yellow or brown colour of the skin, the arched high palate, and the large proportion of cases in which the thyroid gland is enlarged, offer conspicuous points of distinction with the manifestations of ordinary idiocy.

5. In cretinism the muscular and nervous systems are affected in a far greater degree. In idiocy the mental functions may be greatly deficient, out of all proportion to the loss of muscular power and co-ordination.

Treatment.—Much good can be accomplished in the training and education of an idiot. By great patience and experience, he may become somewhat intelligent and his habits well disciplined, as is proved in numerous cases treated at special institutions.

In treating cretins, pure air, abundance of milk, cold and shower baths, and spirituous aromatic solutions applied to the skin are recommended.

Internal remedies are iodide and carbonate of iron and cod-liver oil, sulphate of copper, and oxide and valerianate of zinc.

Galvanism may be employed if there be wasting of the limbs. Great cleanliness and judicious gymnastic exercises are important points of treatment.

CONTRACTION WITH RIGIDITY.—SPASTIC RIGIDITY.—CONTRACTURE.

This affection consists in an idiopathic muscular contraction of various flexor muscles of the extremities, especially of the toes and fingers, occurring independently of any appreciable affection of the cerebro-spinal system. It is frequently associated with laryngismus stridulus, and is most common between one and three years of age. It is usually sympathetic, arising from dentition or gastro-intestinal irritation; but it may be symptomatic of some disease of the brain, as tubercle, or hæmorrhage in the meninges. When the disease is fully manifest, the thumbs are drawn into the palms of the hands, and the fingers, which are powerfully flexed, cover and hide the thumbs. The metacarpo-phalangeal articulations of the fingers are the seat of the flexion, the phalanges themselves being extended and separated from each other. The wrist, forearm, or arms, may become the seat of contraction.

The toes are also in a condition of muscular extension or flexion, and the foot is extended upon the leg. The affected parts are generally the seat of stiffness and shooting pains. The mind is clear, though irritability and restlessness are usually present, and strabismus, convulsions, and other nervous indications sometimes, though rarely, occur. Improvement takes place by intermissions, which become of longer and longer duration as the health becomes restored.

The following distinctions between symptomatic and idiopathic, or essential contraction should be borne in mind:

In the idiopathic or essential form: cerebral symptoms

are not always present, and they never precede the contraction.

The pulse is never irregular.

The contractions are usually intermittent, occurring on both sides, and commencing in the fingers and toes.

In the symptomatic form: cerebral symptoms and functional derangements either precede or accompany the contractions.

The pulse is often irregular.

The contractions are generally permanent and partial, and usually commence in the knees and the elbows, and most frequently in a single extremity.

Prognosis is, as a rule, favourable; and when a fatal result occurs it usually takes place from convulsions.

Treatment.—This must vary according to the cause, whether due to dentition or gastro-intestinal irritation. The contraction itself may be relieved by warm baths, bromide of potassium, belladonna, or zinc oxide, and the health of the child must be supported by all possible means.

INFANTILE ECLAMPSIA, OR CONVULSIONS.

In the first few years of life, the brain is stated to develop so rapidly that when the second year is completed, after the termination of dentition, its size is doubled. The maximum bulk is nearly reached about the seventh year; but according to some authors it is not completed till the twentieth year.

In early life the cranial bones are thin, the substance is elastic, the same amount of nutrition is not supplied from it to the cerebral vessels as in the adult, and therefore fulness of the vessels is very liable to result from any increase of arterial action, cardiac excitement,

or other causes. Since the nervous system is so highly developed, convulsions form one of the most dangerous and frequent of the maladies to which in infant life the nervous system is subject. The mortality from them is higher than that of the great majority of other infantile diseases, and is enormous up to the age of five years, diminishing very considerably after the age of nine.

Male children are more liable to convulsions than female.

Eclampsia consists in a spasmodic action and relaxation of the voluntary muscles, independent of the will, and accompanied by unconsciousness. The term "convulsions" has a wide signification, since they are symptomatic of many conditions in which the lesions are totally different, as in tetanus, epilepsy, tubercle of the brain, and in chorea.

In delicate infants, deficient supply of blood to the brain may induce convulsions.

Symptoms.—The attack may occur suddenly, or may be preceded by indications of nervous excitability. There may be slight feverishness for a day or two; the child is restless; its sleep is disturbed. The eyes appear heavy, and have a peculiar rolling motion. The wrists are bent, and the thumbs are turned inwards. Convulsions may come on during the course of an eruptive disease, or during dentition, but they may also attack a child in its usual health.

As the seizure threatens, the child screams, and has a vacant expression. There is trembling of the eyeball, which is turned downwards, inwards, or upwards, occasionally concealing the pupil. The condition of the pupils is not uniform. They may be dilated or contracted, or one is dilated and the other contracted.

The countenance becomes hideous and greatly

distorted. The jaws close, and there is frothing at the mouth. The muscles of the back and neck are rigid, the head being thrown either to one side or backwards. The feet are inwardly flexed, and the lower extremities thrown into violent agitation.

Causes.—Among the predisposing causes are hereditary nervous susceptibility and dentition. It is probable that in the latter case convulsions are not absolutely caused by dentition; at that period the excitability of the nervous centres is so great that trifling causes, which in adults would lead to hardly any effects, then produce convulsive attacks.

Rickety children, or those in whom dentition is delayed, are frequently subject to convulsions.

Eclampsia may be associated with struma and chronic hydrocephalus in cases where the fontanelles are open and the head is large; it is often seen in connexion with laryngismus stridulus.

Convulsions may accompany or follow severe scalp eruptions in children; they are frequently observed in infants at the breast who are the subjects of diarrhœa and vomiting, and any cause which tends to produce exhaustion may provoke an attack.

Intestinal worms, and diseases of the intestinal canal, are frequently causative; exposure to cold has led to convulsive seizures, and they may arise from blood-poisoning, as in desquamative nephritis with albuminous urine, or may also be caused by burns and scalds.

It is stated that a pin or needle, or a spiculum of bone on the inner plate of the skull, penetrating the cerebral meninges, has led to eclampsia.

Terminations.—Recovery is the usual termination; but when death occurs it is generally from asphyxia, shock, or syncope. In cases where the convulsions

rapidly recur, the prognosis is very grave. As the frequency of recurrence diminishes, so does the danger to life lessen; but there is a risk of their ending by becoming habitual. There appears to exist a marked relation between the convulsions of early infancy and the development of epilepsy in subsequent childhood.

Pathology.—The following appearances may be present after death, viz.: Congestion of the brain and its membranes, effusion into the arachnoid, or into the ventricles, often accompanied by congestion of the spinal cord. These are, however, the result of the convulsions, not the cause. An anæmic state of the brain may cause convulsions, and this condition is sometimes present.

Treatment.—The chief point of importance is to ascertain the cause of the seizure. The child should be placed at once in a warm bath, cold water being simultaneously poured over the face and head. For great distortion of the body during the fits, chloroform may be employed with good results. This substance should be administered when the convulsions are threatening. There is no necessity to anæsthetise the child deeply. If dentition be the cause, and the gums are tense, they should be freely lanced. If irritation of the bowels is present, these parts should be cleared by appropriate remedies. Worms should always be suspected, and remedies suitable for their removal should be exhibited. If the child cannot swallow, an enema should be given in the intervals; to ward off the attacks, the bromides of ammonium and potassium are useful. If there be sleeplessness, a few grains of hydrate of chloral often do good. When the convulsions have ceased, the proper remedies are cod-liver oil and iron preparations, such as the vinum ferri and syrupus ferri hypophosphitis.

DISEASES OF THE SPINAL CORD AND ITS MEMBRANES.

Paraplegia is the most characteristic feature of injury to the spinal cord, as hemiplegia is the prominent symptom of brain lesion; but whereas, in diseases of the brain, the intellect and senses are more or less implicated, in spinal diseases they remain altogether unaffected throughout.

In determining the situation of disease in the cord, it must be borne in mind that :—

1. With complete transverse section of the posterior columns of the cord :

   Loss of power results over the regulation of the movements of the parts below the section, accompanied by hyperæsthesia.
2. With transverse section of the anterior lateral column :

   Paralysis of motion is produced in the parts below the section on the same side of the body.
3. (*a*) With transverse section of the whole of the grey nervous matter :

   Sensation is lost only in all parts below the section.

   (*b*) With transverse section of the right half of the grey matter :

   Loss of sensation (anæsthesia) is produced in the left limb below the section, and increased sensibility (hyperæsthesia) in the corresponding limb of the same side as that of the section, and *vice versa*.

4. With transverse section, therefore, of one entire half of the cord in the parts below the section :

   Paralysis of motion results, with hyperæsthesia on the same side, and anæsthesia only on the opposite side.

5. (*a*) Should inflammation exist in the seat of disease :

   There will be contraction of the paralysed limbs, with rigidity of their muscles.

   (*b*) In the absence of inflammation, or when the inflammation has passed away :

   Flaccidity of the limbs will be observed.

PARAPLEGIA (παραπλήσσω, to strike badly).

Definition.—Paralysis of the inferior half of the body.

Symptoms.—These often commence very slowly and insidiously ; numbness and weakness of the legs and feet being first observed, or tingling and *formication* * of these parts is present, accompanied often, although not always, by excruciating pain. The weakness gradually increases, until sensibility and motion of the lower extremities are utterly lost, the bladder and rectum becoming paralysed. In other respects the patient may appear in perfect health.

The disease sometimes lasts for a considerable time, from a few months to several years, even when it has been the result of accident.

At last the sufferer is obliged to remain in the horizontal position, sloughs form upon the hips and sacrum, death being hastened by their irritation and exhausting

* A sensation as if ants were creeping over the limbs.

discharges. The urine, if allowed to collect in the bladder in any amount, becomes fœtid, ropy, and alkaline. It is supposed that this result is due to the coats of the bladder becoming diseased, and pouring out unhealthy mucus; the urine at the time of its secretion is healthy, but when mixed with the diseased mucus its urea is decomposed, and, carbonate of ammonia being formed, the fluid becomes alkaline.

Involuntary movements and spasms of the muscles are sometimes observed in the lower limbs, although these are completely destitute of voluntary motion, and reflex movement can be more frequently excited in this affection than in hemiplegia.

By these involuntary movements the rest of the patient is frequently broken.

Causes.—Injury to the spinal cord or its membranes, either from accident, serous effusion, or other cause; inflammation, softening, compression, or concussion of those parts; caries or other affections of the cartilages and bones of the vertebral column. It may also be associated with such affections as hysteria, worms, pregnancy, or diseases of the kidney.

It is probable that in some cases the disease may be only *functional*—viz., that no recognisable organic change exists, as when the affection results from cold or intemperance.

Treatment.—In Paraplegia, arising from disease of the cord or its membranes, the same principles of treatment apply as in hemiplegia. A mercurial course may be adopted, and iodide of potassium freely exhibited.

If the paralysis appears to depend upon serous effusion into the spinal cavity, the tincture of cantharides in doses of ½ a drachm has been recommended; embrocations and blisters to the spine are likely to prove serviceable,

PROGRESSIVE LOCOMOTOR ATAXIA

(ἀ, negative; τάξις, order).

Definition.—An affection consisting in impairment or loss of ability to combine and direct muscular movement, *i.e.*, a want of co-ordination over muscular movements.

Symptoms.—The attacks are often preceded by fugitive pains of a neuralgic or rheumatic character, by incontinence of urine at night, spermatorrhœa, anaphrodisia, or by morbid excitability of the sexual organs, by transient paralyses of certain nerves, as the third and sixth pair, and sometimes by impaired vision.

The origin of locomotor ataxy is insidious, and it almost always commences in the lower extremities. The progress of the disease is often slow, and months or years may intervene before the well-marked symptoms are developed, such as a straddling gait, the foot being lifted high in the air and then planted down heel first. As soon as combined movements are attempted, the want of co-ordination appears, the gait, on walking, becomes uncertain and grotesque, the limbs are thrown forcibly forwards in an irregular and uncertain manner, the heels coming first to the ground. Equilibrium is difficult to maintain, the arms being often thrown out in the manner of a person walking on a tight-rope. There is inability to walk or stand when the eyes are closed. At an early period the desire for sexual intercourse is increased; but as the disease advances the sexual appetite and power may be entirely lost. The patient grasps at any near object to support his balance. A sensation of constriction round the waist (as if a cord were tied tightly round it) is complained of. In advanced cases the speech becomes affected, articulation

is difficult and imperfect, but the electro-muscular contractility remains unimpaired to the last. There is no wasting and paralysis of the muscles, and it is impossible to bend the legs against the will of the patient. The patella tendon reflex is absent;* the tongue when protruded is tremulous, the words become unintelligible, strabismus and ptosis are sometimes present, and power over the rectum is occasionally lost. The symptoms observed in the eye in some cases of this affection are the following—viz., (1) Atrophy of the optic nerve; (2) The pupil is insensible to light, but at the same time the accommodation is unaffected.

The prognosis is very unfavourable, the progress of the disease being slow but certain; its duration is variable, and the subjects of the malady frequently die of some intercurrent affection.

Causes.—This affection is said to follow rheumatism, epilepsy, hysteria, syphilis, exposure to cold, extreme exercise, and venereal excesses.

Males are far more often affected than females. It rarely occurs between ten and thirty years of age, and the majority of cases have occurred between thirty and fifty years of age. It has been stated sometimes to follow a fall, causing injury to the loins, or a strain from carrying a heavy weight.

Pathology.—The morbid appearances are not always constant, but the chief of them are said to be atrophy and degeneration of the posterior columns of the spinal cord, with implication of the grey matter of the cord and posterior roots of the spinal nerves; degeneration of the optic nerve, the motor oculi, and tubercula

* If a smart tap (in health) is made upon the patella tendon when the legs are hanging loosely over the side of the bed, the foot is instantly projected forwards; but in locomotor ataxia this phenomenon is absent.

quadrigemina has also been observed. The anterior roots of all the nerves are normal, and the other parts of the nervous system are healthy.

According to Lockhart Clarke, the post-mortem appearances of locomotor ataxia consist in :

"Atrophy and degeneration of the nerve-fibres, to a greater or less extent, with hypertrophy of the connective tissue, which gives to the columns a greyish or more translucent aspect, and in this tissue are imbedded a multitude of corpora amylacea."

Treatment.—There is no special plan of medication, but the following measures have been recommended : Electricity, methodic gymnastic exercises persevered in for several months, nitrate of silver, iodide of potassium, ergot, oil of turpentine and strychnia.

At an early stage it may be advantageous to employ wet rubbings with water, commencing with a temperature of 77° Fahr. and going down to 68°, simultaneously sprinkling and washing the back. The prolonged use of electricity by the agency of the constant current, and attempting to obtain the action of the single poles upon the whole extent of the spinal cord. Both poles should be applied to the vertebral column, one at the lumbar region and another at the nape of the neck ; one pole being fixed, the other may be moved slowly over the back, and in this manner brought into contact with the greater portion of the cord. A strong current should be avoided.

It may fairly be said that benefit can only reasonably be expected from measures calculated to improve the general health, to which end the exhibition of nux vomica, strychnia, and iron preparations will in a great measure contribute.

MYELITIS (μυελός, marrow; itis).

Definition.—Inflammation of the substance of the cord. The grey matter of the cord is the most liable to inflammation, since by it sensitive impressions are transmitted.

Causes.—Amongst the *predisposing* causes are: the male sex and adult age; amongst the *exciting* causes are: violent exertion, exposure to cold and wet, blows and falls, caries of the vertebræ, and concussion of the spine, scrofula and venereal excesses.

Symptoms.—There is dull aching pain in the affected parts, which are somewhat tender on pressure. Voluntary motion and sensation are lost; and there is numbness and impairment of sensibility, with feebleness in the upper and lower extremities, or of both, or of a single limb, or there may be loss of voluntary motion in one extremity, and of sensation in another. Upon applying a hot sponge or ice over the spine, a burning sensation is produced at the upper limit of the inflammation.

The paralysed parts waste from inaction, reflex action remaining intact. The muscles of the affected member may be convulsed, contracted, or relaxed, unless the inflammation spreads to the brain. There is no derangement of the intellectual faculties. After a time, incontinence of urine or retention comes on, bed-sores form, and the motions are passed involuntarily, the patient eventually sinking from exhaustion, or dying comatose from the brain becoming attacked. The symptoms vary according to the seat of the disease:

If the *Lumbar* portion be inflamed, the inferior extremities are paralysed, there is retention of urine, followed by incontinence, and constipation succeeded

by involuntary evacuation of fæces. Impotence is a frequent, although not a necessary result.

If the *Dorsal* portion be inflamed, continued convulsive movements present themselves, accompanied by palpitations, difficulty of respiration, and a sense of constriction in the abdomen.

If the *Cervical* portion be inflamed, there are: paralysis of the superior extremities, dysphagia and dyspnœa, with a sense of tightness in the chest and epigastrium. There is occasionally troublesome priapism.

Sometimes the onset of the disease is very insidious; it advances very slowly, is accompanied by no pain, and at last is accompanied by paralysis of the rectum, bladder, and inferior extremities.

The prognosis is very unfavourable, and entire recovery very rare. The disease may become chronic and last for several years.

Pathology. — On post-mortem examination, the affected tissue usually appears much softened; it is often of a creamy consistence. Small extravasations of blood are sometimes seen; in rare cases an abscess forms. *Microscopically*, broken down nerve-fibres, blood-cells, granules, and pus corpuscles are observed.

More or less spinal meningitis is always present. Sometimes the cord becomes indurated from fibrinous exudation.

A Chronic Myelitis or White Softening of the cord is sometimes observed, in which the cord is white or of a more or less red or yellowish colour. This may arise from acute myelitis, from gradual pressure upon the substance of the cord from injury, or from failure of nutrition from the vessels becoming degenerated.

SPINAL MENINGITIS.

Definition.—Inflammation of the membranes of the cord.

It is more common in new-born infants, in whom it is regarded as pyæmic.

Causes.—The same as of inflammation of the cord. As in the case of cerebritis and cerebral meningitis, it is very improbable that the brain is affected without the membranes becoming involved, and *vice versâ;* so with myelitis and spinal meningitis, the inflammation is rarely limited to one or the other structure.

Pachy-Meningitis, or acute inflammation of the dura-arachnoid, is very rare, but it has been known to follow damp and cold and injuries, and may arise from disease of the vertebræ spreading to the spinal membranes.

Diphtheria, typhoid fever, small-pox, and occasionally scarlatina have been followed by spinal meningitis.

Symptoms.—There is pain in the affected part, which may be confined to the dorsal and cervical region, increased by percussion, motion, pressure, or heat. The pain is often of a rheumatic character, extending along the back, and to the limbs, and shooting round the chest and abdomen. There may be spasms of the muscles, with subsequent loss of motion and paralysis.

When the disease results from cold or rheumatism, there is a fair prospect of recovery under appropriate treatment; but, when the spinal membranes are inflamed from causes other than those just mentioned, there are contractions of the neck, back, and limbs, according to the situation of the disease, giving rise to trismus, torticollis (wry-neck), complete or partial

opisthotonos, or even tetanic spasms; there is also a feeling of constriction in the chest, neck, or abdomen, with an urgent sensation of suffocation. The disease is then very rapid in its progress, and is generally fatal from the 10th to the 24th day, with typhoid symptoms, delirium, and coma.

Pathology.—The dura-arachnoid is thickened, its vessels congested, and there is effusion of puriform lymph, and serum.

When LEPTO-MENINGITIS, or inflammation of the pia-arachnoid is present, there is an irregular appearance of the cord, due to effusion of lymph in the arachnoid space.

When caused by disease of the vertebræ, and the structures in their vicinity, the inflammation is localised in portions of the spine; but if due to a general cause, it may extend over the whole extent of the spine, selecting the posterior rather than the anterior aspect.

SPINAL IRRITATION.

Symptoms.—There is more or less impairment of motion in the upper or lower extremities, according to the seat of the irritation and to the degree of mischief. There are languor and obscure pain in the cervical or lumbar region; occasionally the pain is so great as to resemble disease of the vertebræ. There may be some tenderness along the spine, and more or less stiffness of the neck, accompanied by pain in moving the head, may be present. The affection may be the result of masturbation or of severe falls.

OTHER DISEASES OF THE SPINAL CORD.

Serous Effusions.—These may take place within the spinal canal, beneath the arachnoid, or external to, or within the dura mater.

Extravasations of Blood (Spinal Apoplexy).—May occur in the same situation as serous effusions. May be caused by falls, slips, blows, or other injuries to the spine, or by violent efforts. Blood effusions have, however, taken place without any previous accident. The symptoms are pain in the back, spasmodic contractions of muscles, paralysis of the bladder, rectum, and lower extremities, coma, convulsions and death.

Induration.—May arise from the same cause as cerebral induration.

Fungous Growths.—May occur on dura mater, causing pressure and paralysis.

Atrophy and Hypertrophy of the cord sometimes occur, as also Tubercular Deposits, Carcinomatous Degeneration, Hydatids, Aneurismal, and other Tumours.

Concussion or Compression of the spinal marrow may be caused by external injuries. When concussion is severe, reflex motions of the limbs may be excited.

The recognition of the above conditions is a matter of extreme difficulty.

SPINA BIFIDA. HYDRORACHIS.

This is a congenital malformation, consisting in one or more fluid tumours on the cervical, dorsal, or lumbar vertebræ communicating with the spinal canal. The spines, and usually the laminæ of the corresponding

vertebræ are wanting. The tumours are of variable size, often transparent, the colour of the skin covering them being normal, livid, or reddish. Pressure upon the tumour produces symptoms of compression of the brain. The bladder and rectum are often paralysed. The limbs are usually imperfectly developed.

In some cases the skin is absent. The tumour is then covered by dura mater, pia mater, and arachnoid membrane. The pia mater is red and congested. Sometimes there is a division of the medulla, or at the seat of the tumour it may be entirely absent.

Serous, transparent, blood-stained, or purulent fluid may be found in the sac of the arachnoid. The fluid may communicate with the brain.

TREATMENT OF SPINAL DISEASES.

In acute inflammations of the spinal cord, the patient must be kept in the recumbent position. The prone position is also very useful. Ice may be constantly applied along the spine; blistering, or an issue on each side of the spine have been recommended, or even a few leeches.

The value of drug medication is doubtful; but in spinal affections of rheumatic origin, iodide of potassium and colchicum may be employed with advantage.

Belladonna, conium, and ergot are by some considered to act beneficially when the cord is involved.

The bladder and bowels must be especially attended to; the patient kept clean and dry. In chronic affections, bed-sores must be guarded against, in the treatment of which the air bed or water-bed is very useful.

The general health must be supported by good food, and good hygienic conditions, with tonics, viz.: phosphorus, iron, strychnia, and quinine. When there are

syphilitic deposits, perchloride of mercury and iodide of potassium must be exhibited.

In the treatment of spina bifida, the tumours should be protected by some shield—as cotton-wool, or a well-fitting felt case. Tapping with a fine trocar and gradual emptying of the liquid contents have in some cases proved effectual. Success has also followed tapping of the tumour, followed by injections of iodine solutions, or glycerine with iodine; or excision may be adopted, if it is quite certain that no portions of the spinal cord or nerve trunks are included in the tumour.

SCLEROSIS.

In the discussion of diseases of the nervous system, a good deal of confusion has been created in connexion with that class of lesions in which hardening of the tissues is a distinctive feature. It is a little unfortunate, perhaps, that the word "cirrhosis" has not been more generally applied to such changes; for, practically, the conditions which exist in such diseases as cirrhosis of the liver and sclerosis of the spinal marrow are of a similar nature. In both cases the "hardening" that ensues depends on an overgrowth of the connective-tissue of the part, hypertrophy of which destroys the functional powers and the structural integrity of the organ involved, through pressure on the essential elements in each instance. Moreover, there is no common agreement among pathologists in the terminology that is adopted; nor is "sclerosis" commonly used to indicate all lesions in which overgrowth of connective-tissue in the nervous system is a characteristic feature. For this reason, therefore, it has seemed desirable to give a brief description in this place of the meaning of "sclerosis" in its application

to diseases of the nervous system; and to associate with it an account of the two affections classed as "scleroses"—namely, lateral sclerosis, and disseminated sclerosis. In previous sections the other diseases in the production of which overgrowth of neurogliomatous connective-tissue is found, *e.g.*, locomotor ataxia, etc., have already been described.

The **Pathology** of sclerosis, as already indicated, includes an account of changes originating in the fine connective-tissue network distributed throughout the nervous structures, and serving as a support for the more important elements—the nerve-cells and nerve-tubules. Under conditions of disease, this connective-tissue, or neuroglia, undergoes an increase in bulk, and, as a consequence, the proper nerve elements are subjected to pressure and atrophy, the necessary effects of which are complete destruction of the conducting properties of the nerves, and of the activity of the central cells. According to the position and extent of the induration, so will the symptoms produced differ both in degree and in the parts affected, paralysis being a main result of the changes.

The **Causation** of sclerosis is not always easy to comprehend. In some cases it is undoubtedly a sequel of inflammation extending from the coverings of the cord, etc., and may result from pressure of tumours, curvature, etc. Gout, syphilis, and sexual over-indulgence are likewise credited, probably through the agency of a vitiated blood-supply, with inducing it; and heredity also is regarded by some as an efficient cause. The form of sclerosis affecting the posterior columns of the cord in tabes dorsalis is frequently found in syphilitic subjects.

MULTIPLE SCLEROSIS.

This disease is also known under the names of **Disseminated, Cerebro-Spinal,** and **Insular Sclerosis.** It is an affection of which the anatomical characters are over-growth of the neuroglia, associated with atrophy and degeneration of the essential nerve-elements. It is often found in those who have indulged immoderately in alcoholic liquors, and sometimes it appears to originate from exposure to cold. It is most frequent between the years of twenty and thirty, but may be encountered in much older or younger subjects.

The morbid growth is most plentiful in the white substance of the brain and cord, and consists of hard round nodules having a greyish translucent appearance. On examination of a section of such a growth the neuroglia is found much increased, its nuclei and fibres being distinct, and the nerve-fibres are atrophied, although their axis-cylinder can generally be made out.

Consequent on the varying distribution of the nodules, the symptoms present differences in different cases; but the following description applies to most: Weakness and trembling of the muscles first appears, one of the lower limbs being usually affected at the outset, and then that of the opposite side, and in course of time actual paralysis may supervene; but remissions often occur temporarily; general sensibility is not impaired, and the bladder and rectal functions are not interfered with. Later on, the upper limbs, head, face, lips, etc., may share in the paralysis and tremor; and it is characteristic of the latter symptom that it appears only on attempting voluntary movements, entirely ceasing during sleep and when the muscles are not in action. It is much exaggerated towards the completion

of a muscular movement, as, *e.g.*, in raising a cup to the lips, the contents being spilled with a jerk just as the lips are being reached. Closing the eyes does not increase the trembling; the knee-jerk is exaggerated, and ankle clonus can easily be produced. One symptom is very characteristic of this affection, *viz.*, a slow, deliberate speech, each syllable of every word employed being carefully enunciated, the term "syllabic utterance" which is applied to it being exactly descriptive of it. Nystagmus (rolling of the eyeball) also is a frequent symptom.

The progress of the disease is very slow, extending over many years; and death usually occurs from some complication, or from asthenia. Its later stages are characterised by increasing paralysis and mental symptoms, dementia being not uncommon as the brain becomes increasingly involved.

Treatment hitherto has seemed to exert little influence on the progress of this disease. General hygienic measures should be persevered in, and attention given to secure regularity of the bodily functions. Iodide of potassium, arsenic, zinc, and other remedies have been given internally, but with little apparent effect.

LATERAL SCLEROSIS.

In this affection the seat of the lesion is in the antero-lateral columns of the cord, and its onset is evidenced by weakness of the lower limbs, which soon increases to a considerable extent; at the same time walking becomes difficult, a characteristic gait forming one of the distinctive features of the disease. The patient advances with the body bent, as if about to fall forward; the legs are held close together, and there is a curious tendency to walk on the tips of

the toes. This difficulty is due to a rigid contraction of the muscles of the legs, which, from being spasmodic at first, becomes gradually tonic in character, and with it exaggerated patellar tendon reflex and ankle clonus (convulsive movement) may be elicited. There is no loss of power over bladder and rectum, but constipation is usually present. As the disease advances the upper limbs are affected, owing to extension of the sclerosis, and its course is a lengthy and tedious one, death as a rule occurring from some complication. The affection is known by the name also of "spastic paralysis," from the peculiar mode of walking adopted by those suffering from it, which also has been termed "spastic gait." It is most common between the ages of thirty and fifty.

Treatment is here, too, very unsatisfactory; and what has been said of multiple sclerosis will equally well apply to it.

DISEASES OF THE EAR.

The internal and middle ear present few points of difference in the child and in the adult, since the structures are early developed. The three little auditory ossicles at birth are almost full grown.

The external bony structures are, however, very dissimilar at birth to what they become in youth and adult age. In the new-born infant there is no positive external bony meatus, but a mere ring of bone.

Thus, in the very young child, the membrana tympani is far closer to the surface than in the adult.

The plane also of this membrane is almost horizontal, and lies nearly level with the base of the skull.

The external meatus is shut off from the tympanic cavity by the membrana tympani, which is exceedingly vascular, and thus inflammation is easily transmitted from one side of it to the other. Inflammation of the tympanum is very common when cold, damp, or injury have set up inflammation in the external surface of the membrane. The cavity of the tympanum is lined by mucous membrane, and with it communication is effected with the pharynx by the Eustachian tube.

During the act of swallowing the canal is opened; and during this act, if a little water be swallowed, the rush of air into the tympanic cavities gives rise to two simultaneous clicks, which are rendered more evident if the nose be closed.

It is necessary for the transmission of vibrations with exactitude that air should be present on the inner side of the membrana tympani as well as on the outer side of this membrane.

Diseases of the ear may be divided into two **Varieties**, viz., catarrhal deafness and otorrhœa.

CATARRHAL DEAFNESS.

Thickening of the mucous membrane of the Eustachian tube, with its subsequent obstruction, may be caused by constant attacks of severe coryza, or of sore throat. Enlargement of the tonsils usually co-exists; a feeling of heaviness in one or both ears is complained of, and decided deafness succeeds. The inflammation spreads from the Eustachian tube to the cavity of the tympanum, the aural pain becomes constant, and the inflammation may become of an acute character. In consequence of the atmospheric pressure being greater

external to the tympanum than internal to this structure, blockage of the Eustachian tube occasions great external concavity of the tympanic membrane.

Catarrhal deafness, then, may be the result of chronic inflammation of the Eustachian tubes, or of inflammatory processes taking place in the tympanum. This deafness often takes place before the occurrence of any discharge from the ear, and the pain begins to subside as the discharge appears.

Purulent inflammation of the mucous membrane of the tympanum, with perforation of the tympanic membrane and escape of fetid, unhealthy pus by the meatus auditorius externus is one of the most troublesome affections met with in children.

OTORRHŒA,

Or discharge from the ears, although usually not of a serious nature, may lead sometimes to meningitis, necrosis of the petrous portion of the temporal bone, to facial paralysis, and perhaps to abscess of the brain. It may result also from otitis, or inflammation of the ear.

It sometimes occurs in delicate, strumous children, appearing as a low form of catarrhal deafness; it is also one of the sequelæ of the eruptive fevers, especially scarlatina, in which case it is the result of otitis of the middle ear, and it may follow other diseases.

Otorrhœa may be easily recognised by the constant purulent or muco-purulent discharge from the external meatus.

The discharge is frequently fetid, even when no diseased bone is present. The free exit of any morbid fluid from the external meatus nearly always denotes perforation of the tympanic membrane, since an

abundant secretion from that passage alone is very uncommon. This perforation is a constant feature of chronic otorrhœa, and of itself is not serious, since it admits of injections into the cavity of the tympanum; and in fact perforation is in the direction of safety, since, if the discharge could find no external outlet, it might tend to burrow inwards, and set up meningitis or cerebritis.

Polypoid Growths in the ear often arise from the discharge of purulent matter from the meatus. The most common of these growths is the ordinary mucous polypus, and is similar to that which occurs in the uterus and the nose. Aural polypi almost always take origin from the walls of the tympanic cavity.

A perforation in the tympanum sometimes may be exceedingly small, resembling a pin-hole, but in some rare cases it is so extreme that a mere crescentic ridge at the bottom of the meatus externus denotes the situation of the tympanic membrane. A very general symptom of otorrhœa is enlargement of the upper cervical glands. It is always accompanied by more or less deafness—and this symptom may be extreme in a mild case, and sometimes slight, even when the ossicles are lost, and the greater part of the membrana tympani is destroyed. Complete deafness almost invariably follows the falling out of the stapes. In order to determine the amount of mischief, it is necessary to syringe the ear with warm water, cleaning the meatus by a piece of wool wrapped round a quill pen. This operation is requisite, since the discharge prevents the deeper parts of the meatus being seen. Generally the membrana tympani can be seen, very vascular, and presenting a minute perforation; but occasionally, when the membrane is destroyed, the cavity of the tympanum can be observed clearly through the speculum, the promontory being coated

with brilliant red granulations, and the malleus standing out boldly. In some cases the perforation is so small that at first it cannot be detected; but if during the inspection the patient be asked to make a forcible expiration with the nose and mouth closed firmly, then the discharge can be observed coming through the opening. The presence of minute perforations which are invisible at first sight, may be suspected by the existence of a pulsating motion in the thin layer of fluid by which the outer side of the membrana tympani is covered.

Treatment.—When the mucous membrane of the ear is involved, the local and general measures which are beneficial in coryza and tonsillitis, will be necessary, viz.: weak astringent applications, cod-liver oil, and tonics; the morbid collections must be removed daily, the ear being syringed several times a day with tepid water. When there is fœtor, a little carbolic acid may be added to the water (1 in 40, or 1 in 50). A few drops of a weak astringent solution may be poured into the ear, such as sulphate of zinc, gr. i.—v. with borax gr. v.—x., glycerine ʒi. and water ʒi. After checking the discharge, the edges of the perforation may be touched through a speculum, with solid nitrate of silver. An artificial membrane may be worn if the membrana tympani is much destroyed. A plug of wool moistened with glycerine and sulphate of zinc often proves effectual.

Otorrhœa may be cured in a few months by careful treatment, but it is liable to recur frequently in children.

ECZEMA OF THE AURICLE.

This is a very common affection in infancy. It causes great irritation, and is very disfiguring. It may be caused by otorrhœa, by the use of coarse soap or by dirt, and it is frequently accompanied by eczema of the head; but it may arise from derangements of the constitution.

The local treatment should consist in the application of the saccharated solution of lime and glycerine in equal parts, or vaseline. In cases of constitutional disturbance, alteratives must be given, followed by tonics.

AURAL ABSCESS

May arise from debility, or from the presence of dirty wool in the meatus, or by the abuse of injections.

The ear should never be washed out with water, and dried by forcing the corner of a towel into it. Ear-ache, inflammation of the internal meatus, or blocking of the passage by collections of cerumen, may be occasioned by the above practice. By nature the meatus is dry, the cerumen falls off as a fine powder, and if it be moistened it concretes into a thick mass.

The treatment must consist of warm fomentations, constitutional remedies, and early incision.

EAR-ACHE, OR TRUE AURAL NEURALGIA,

Is characterised by extreme pain, but it is unaccompanied by febrile symptoms, appears suddenly, and disappears as suddenly, and it does not increase in intensity, as is the case with inflammation of the ear.

It must be treated with moderate purgation; a little oil and tincture of opium, or a drop or two of chloroform on cotton wool, may be placed in the ear.

TABLE SHOWING

THE DIFFERENTIAL DIAGNOSIS

OF STATES OF

SUDDEN UNCONSCIOUSNESS.

TABLE SHOWING THE DIFFERENTIAL DIAGNOSIS

Cause.	Pulse.	Respiration.	Temperature.	Pupils.
Cerebral Congestion.	Slow and full.	Slow and laboured. Not stertorous.	Above normal.	Contracted, with feeble reaction.
Cerebral Hæmorrhage.	Slow, full, often irregular.	Slow, laboured, and stertorous.	1. Below normal. 2. Later, becomes normal. 3. Still later, rises rapidly (105-7°).	Variably unequal, insensible to light.
Meningeal Hæmorrhage.	Slow, full, and irregular.	Slow and stertorous.	Variable.	Variable, insensible to light.
Cerebral Embolism.	Slow, weak, and small.	Slow and full.	Slightly lowered.	Normal.
Cerebral Inflammation.	Rapid and irregular.	Shallow and irregular.	Higher than normal.	Unchanged.
Cerebral Hysteria.	Small, feeble, but regular.	Rapid and quiet.	Normal.	Unchanged.
Cerebral Concussion.	Slow, feeble, and intermittent.	Feeble, sighing, or almost extinct.	Below normal.	Unequal. Reacting feebly.
Cerebral Contusion.	Slow and feeble.	Slow but quiet.	Normal or slightly elevated.	Contracted. Insensible to light.
Cerebral Compression.	Slow, soft, and irregular.	Slow, laboured, and stertorous.	Variable, usually increased.	Dilated or unequal. Insensible to light.
Uræmia.	Slow, feeble, and irregular.	Slow and laboured, with peculiar stertor.	Progressively lowered.	Dilated and indolent.
Narcosis (Opium).	Small, feeble, and irregular.	At first frequent, Later, superficial and slow.	Normal or slightly lowered.	Much contracted. Insensible to light.
Intoxication (Alcoholic).	Small, feeble, and frequent.	Slow and laboured. Sometimes stertorous.	Much lowered.	Contracted. Dilating under stimulation and again relapsing.
Epilepsy.	Rapid, feeble, and irregular.	Difficult, irregular, often gasping.	High (to 105° Fahr.).	At first dilated, later contracted. Insensible to light.
Syncope.	Rapid and thready or extinct.	Feeble and quiet.	Below normal.	Dilated.
Insolation (Sunstroke).	At first, slow and full. Later, rapid, feeble, and frequent.	Rapid and slightly stertorous.	Very high (104°-10° Fahr.).	Contracted. Insensible to light.
Asphyxia.	Slow and feeble.	Slow, feeble, and gasping.	Lowered.	Variable, usually contracted.
Catalepsy.	Normal rate, but feeble.	Slow and regular.	Normal.	Dilated and very sensitive to light.

* This table is abstracted from a contribution by Dr. R. O.

OF CAUSES OF SUDDEN UNCONSCIOUSNESS.

Motor Power.	Intellect.	Sensation.	Special Senses.	Countenance.	Miscellaneous.
Partial paralysis. Reflexes impaired.	Wholly or in part lost.	Impaired.	Partially Impaired.	Flushed or cyanotic.	Venous distension of face and neck. Retinal engorgement.
Hemiplegia. Reflex action abolished.	Completely suspended.	Entirely lost.	Impaired.	Variable.	Sphincters relaxed or paralysed. Deglutition impaired. Ptosis frequent.
Paralysis more or less general. Reflexes unimpaired.	Suspended.	Anæsthesia accompanying paralysis.	Somewhat impaired.	Variable.	Sphincters relaxed. Vomiting usual.
Hemiplegia, usually of the right side. Reflex action normal.	Transientlysuspended.	Partially lost.	Normal.	Pale.	
Muscular relaxation. Slight convulsions. Reflex action suspended.	Suspended.	Hyperæsthesia.	Unimpaired.	Variable.	General evidences of inflammation.
Normal.	Partially suspended.	Blunted.	Somewhat impaired.	Natural.	Spasmodic movements of eyes and eyelids.
Muscles weak and flaccid. Reflexes impaired.	Suspended.	Entirely lost.	Act feebly.	Very pallid.	Surface cold. Vomiting frequent. Paralysis of bladder and sphincters.
Muscular rigidity. Slight facial spasms. Paralysis of eyelids. Reflexes impaired.	Suspended.	Impaired.	Impaired.	Pale.	Sphincters relaxed.
Hemiplegia. Reflexes abolished.	Suspended.	Entirely lost.	In abeyance.	Very pale.	Deglutition impossible. Sphincters paralysed. Retention of urine.
Epileptiform convulsions. Reflex action feeble.	Suspended.	Impaired.	Impaired.	Pallid.	Anasarca. Odour of urine in the breath. Albumen and casts in urine.
Complete muscular relaxation. Reflexes abolished. Convulsions in morphia poisoning.	Suspended.	Impaired.	Impaired.	Pale and shrunken. Sometimes livid.	Odour of opium in the breath. Vomiting. Secretions arrested. except that of skin.
Muscular relaxation. Reflex movements suspended.	Suspended.	Complete anæsthesia.	Impaired.	Variable.	Odour of alcohol in the breath.
Convulsions. Reflex action somewhat impaired.	Suspended.	Lost.	Unimpaired.	Pale. Ashy hue.	Eyelids tremulous. Eyeballs prominent. Tongue bitten.
Muscles relaxed. Reflexes unimpaired.	Suspended.	Impaired.	Impaired.	Very pallid.	Cardiac and venous murmurs.
Muscular relaxation. Reflex action feeble.	Completely suspended.	Impaired.	Impaired.	Variable.	Skin hot and harsh. Vomiting and purging.
Convulsions. Reflex action impaired.	Suspended.	Impaired.	Disturbed.	Turgid.	
Muscular rigidity. Reflexes disturbed.	Suspended.	Impaired.	Partially impaired.	Pallid.	Retinal anæmia. Eyelids tremulous.

TENDON REFLEX PHENOMENA.

Within the past few years very considerable strides have been made in the study of diseases of the nervous system, and especially in connexion with the diagnosis of these affections, which in many cases has now reached a stage of perfection scarcely conceivable when the difficulties surrounding this complicated class of diseases are considered. Much of the work thus accomplished has been done by continental specialists, and notably Erb and Rosenthal have added largely to our knowledge in this direction. But our own countrymen also have been largely instrumental in following up the investigations attended with such happy results to medical success; and the names of Ross, Buzzard, Ferrier, and Bramwell, must be equally remembered as among the most prominent of those to whom is due much that is valuable as assisting towards the comprehension of the lesions of the nervous system, and their appreciation by the senses of the physician.

In former pages of this work considerable evidence has been given of the kind of information on which reliance is placed when determining the precise locality and degree of degenerative changes in the nervous centres; thus, the results of electrical stimulation of surface areas of the body have been constantly referred to as diagnostic of particular conditions; the application of other stimuli also has been explained, with a view to determining the delicacy of touch and sensation to pain, look, etc.; and in this place it is proposed briefly to discuss the nature of those signs which more than any other phenomena have acquired importance in recent times as indicative of disturbance in the nerve centres, viz., what have been termed "tendon reflexes."

The meaning of this expression is very well conveyed

by the name itself: it is that on being artificially stimulated certain tendons in the body are reflexly excited to action by contraction of the attached muscle, and so afford an indication of the state of the centre whence their motor impulse is derived. The particular tendon on which the facts to be presently described were first noticed is that of the patella, whence originated the well-known expression "patellar tendon reflex." If, in a healthy body, one leg be allowed to hang loosely crossed over the other knee, or depending over the side of a bed or table, and then a smart tap be administered to the tendon with any suitable instrument—the chest-plate of a wooden stethoscope answers admirably—the leg will be seen to be at once "jerked up." Supposing, however, that the same experiment is similarly conducted on a person suffering from advanced locomotor ataxy, no responsive jerking of the limb will follow on the tap; in other words, no reflex action takes place.

An explanation of this phenomenon, and of its absence, is this: Under conditions of health, when the tendon is struck, the impulse so created is transmitted along the sensory nerve-tract to a point in the lower dorsal region of the spinal cord in which is the centre for this particular act. Here the sensory impulse is transformed through the agency of the nerve-cells into a motor impulse, which, travelling down along the motor nerves, excites contraction of the quadriceps muscle, and so jerks up the lower limb. It will be observed, therefore, that the act is purely a reflex one, the *centre* of the chain being in the dorsal spine. In common, however, with all such acts, the higher cerebral centre exercises a constant controlling power over the reflex activity of the cord at this point as long as the conducting power of the cord itself is intact. But, should the latter be, at any point above the patellar reflex centre, so affected

that its integrity as a conductor of controlling impulses is destroyed, then there will be nothing to check exaggerated action of the reflex centre itself. Accordingly, we find that in the early stages of tabes dorsalis or locomotor ataxia the "knee jerk" is greatly *increased*, because, the spinal cord *above* the patellar centre being disorganised, the latter acts without control, and thus the jerk of the leg is much intensified. As the disease, however, extends downwards along the cord, it by-and-by implicates the patellar centre itself, and at this stage, following the sclerotic changes then produced, the nerve-cells lose their vitality, become degenerated and incapable of function, and *then* all power of motion is lost, and the patellar reflex is conspicuous by its absence. This sign is, therefore, one of the most absolutely certain indications of the progress of those degenerative changes which have already been described under the head of locomotor ataxy.

The next most important tendon reflex is that known as "ankle clonus." It consists of a series of rapid clonic (intermittent) contractions of the foot upon the ankle, produced when the former is forcibly flexed on the latter by strongly pressing the palm of the hand on the plantar surface of the patient's foot. This sign is also to be elicited in subjects of tabes dorsalis as the disease advances, as well as in other special cord diseases. In health it is *absent* (though said to be found present once in about fifty healthy subjects), and its appearance indicates disease in the cord above the lumbar region.

Space will not permit to enter into detail respecting numerous other tendon reflexes of the body, such as those of the wrist, biceps, etc. But in the case of any one of them the *rationale* is the same, and with modifications to adapt it to each case, the explanation of all is the same; the special point being the indication of

special degenerations afforded by the changes produced in comparison with the condition of things existing in health. Its importance, in a diagnostic sense, will be at once understood, and students should endeavour to make themselves thoroughly acquainted with the phenomena as they present themselves in every case of disease which comes under their notice.

END OF PART III.

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